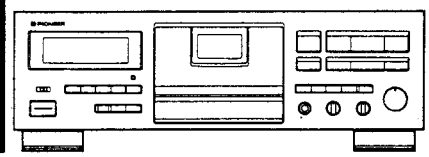
PIONEER®
The Art of Entertainment

Service Manual



ORDER NO.
ARP2549

STEREO CASSETTE DECK

CT-42

- **This manual is applicable to CT-42/KU/CA.**

CONTENTS

1. SAFETY INFORMATION ····2
2. PACKING AND PARTS LIST ····3
3. EXPLODED VIEWS AND PARTS LIST ····4
4. BLOCK DIAGRAM ····10
5. SCHEMATIC AND PCB CONNECTIONS DIAGRAMS····11
6. PCB PARTS LIST ····27
7. ADJUSTMENTS ····33
8. IC INFORMATION ····38
9. CIRCUIT DESCRIPTIONS ····46
10. PANEL FACILITIES····51
11. SPECIFICATIONS ····52

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This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING
Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).
When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

1. SAFETY INFORMATION

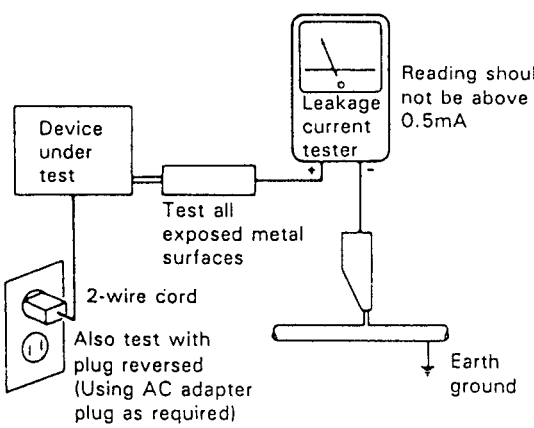
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.


Reading should not be above 0.5mA
Leakage current tester
Device under test
Test all exposed metal surfaces
2-wire cord
Also test with plug reversed (Using AC adapter plug as required)
Earth ground

AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.
The use of a substitute replacement component which dose not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

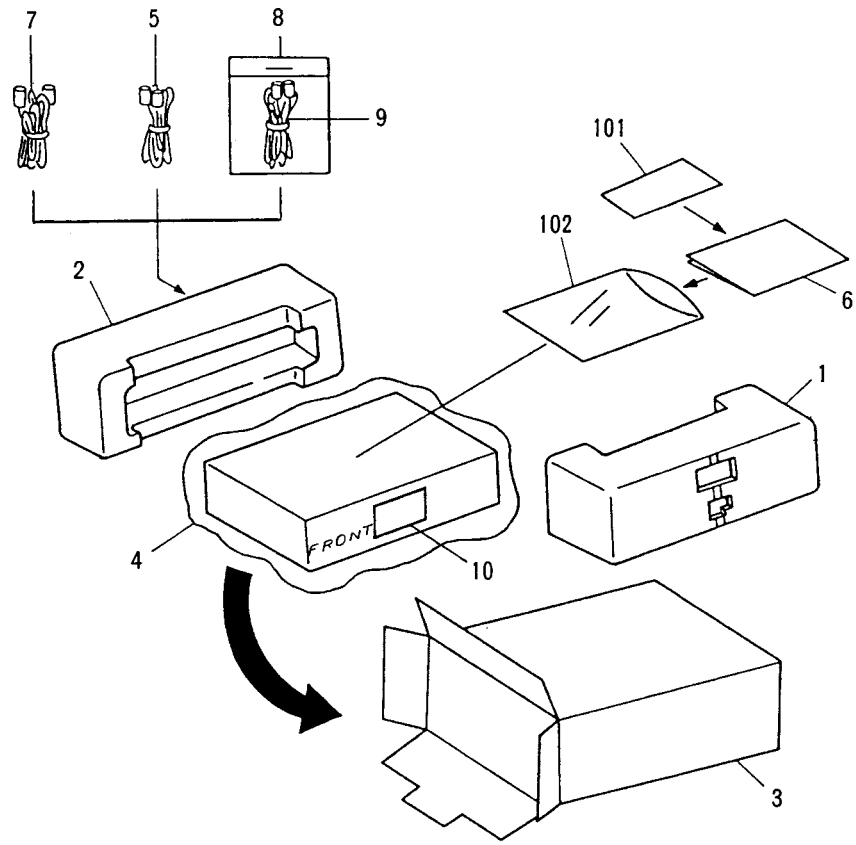
2. PACKING AND PARTS LIST

NOTES:

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

Parts List

Mark	No.	Description	Part No.
	1	Pad (F)	RHA1073
	2	Pad (R)	RHA1074
	3	Packing case	RHG1367
	4	Sheet	RHX1007
	5	Control cord	RDE1031
	6	Operating instructions	RRE1057
	7	Connection cord (with mini plug)	PDE – 319
	8	Connection cord assembly	RDE1002
	9	Connection cord	RDE – 010
	10	Sheet (For transportation)	RHC1028
NSP	101	Warranty card	ARY1026
NSP	102	Vinyl bag	RHL – 018



3. EXPLODED VIEWS AND PARTS LIST

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3.1 EXTERIOR

Parts List

Mark	No.	Description	Part No.
⚠	1	Strain relief	CM – 22C
⚠	2	AC power cord	PDG1015
⚠	3	FU601, FU602 Fuse (1.6A)	REK – 074
⚠	4	T1 power transformer	RTT1203
⊙	5	Mechanism unit	RYM1161
	6	Absorb plate (B)	PNB1109
	7	Door spring	RBH1306
	8	Cushion	REB1174
	9	Protector	RED1020
	10	Cord clamper	RNH – 184
	11	Panel stay	RNT1142
	12	Name plate	AAM1001
	13	Screw	ABA1148
	14	Foor assembly	AMR1159
	15	LED lens	AMR1160
	16	Side sheet (sponge)	PNM1150
	17	Lens S	PNW1893
	18	Counter reset knob	RAA1009
	19	Slide SW knob	RAC1562
	20	Power button	RAC1703
	21	Balance knob	RAC1705
	22	VR knob	RAC1707
	23	Function knob	RAC1718
	24	FL filter	RAH2087
	25	VR ring	RAT1011
	26	Door sheet (rubber)	REB1191
	27	Side spacer (rubber)	PEB1198
	28	Door lens	RAH1927
	29	FL lens	RAH2032
	30	Side panel	RAH2044
	31	Styrol protector	RHC1028
	32	Screw	BBT30P100FZK
	33	Screw	BBZ26P080FZK
	34	Screw	BBZ30P080FZK
	35	Screw	FBT40P080FZK
	36	Screw	IBZ30P060FCC
	37	.....	
	38	Screw	IBZ30P080FCC
	39	Screw	IBZ30P100FCC
	40	Screw	IBZ40P080FCC
	41	Rivet	RBM – 003
	42	Jack nut	RBN – 006
	43	Cord clamper	REC – 371
	44	Front panel assembly	RXX1513
	45	Door assembly	RXX1515
	46	Bonnet	RXX1516
	47	Fiber washer	VEC1254
NSP	101	ENCODE unit	RWZ2327
NSP	102	DECODE unit	RWZ2328
NSP	103	VR unit	RWZ2333
NSP	104	BAL. VR unit	RWZ2334
NSP	105	HEADPHONE unit	RWZ2338
NSP	106	CONTROL unit	RWZ2652
NSP	107	FL unit	RWZ2653
NSP	108	OPERATION unit	RWZ2654
NSP	109	BIAS unit	RWZ2655
NSP	110	MAIN unit	RWX1068
NSP	111	Cord clamper	DNF1128
NSP	112	Binder holder	PNW1021
NSP	113	Washer	RBF1017
NSP	114	Rubber spacer (A)	REB1057
NSP	115	Spacer (rubber)	REB1187
NSP	116	Spacer (rubber)	REB1192
NSP	117	Acetate tape	REH1020
NSP	118	Main chassis	RNB1059
NSP	119	Center stay	RNC1058
NSP	120	Center stay	RNC1059
NSP	121	PCB base	RNE1221
NSP	122	PCB stud	RNL – 792
NSP	123	Door	RNK1820
NSP	124	Front panel	RAH2043
NSP	125	Rear panel	RNA1567
NSP	126	Door panel	RAH2053

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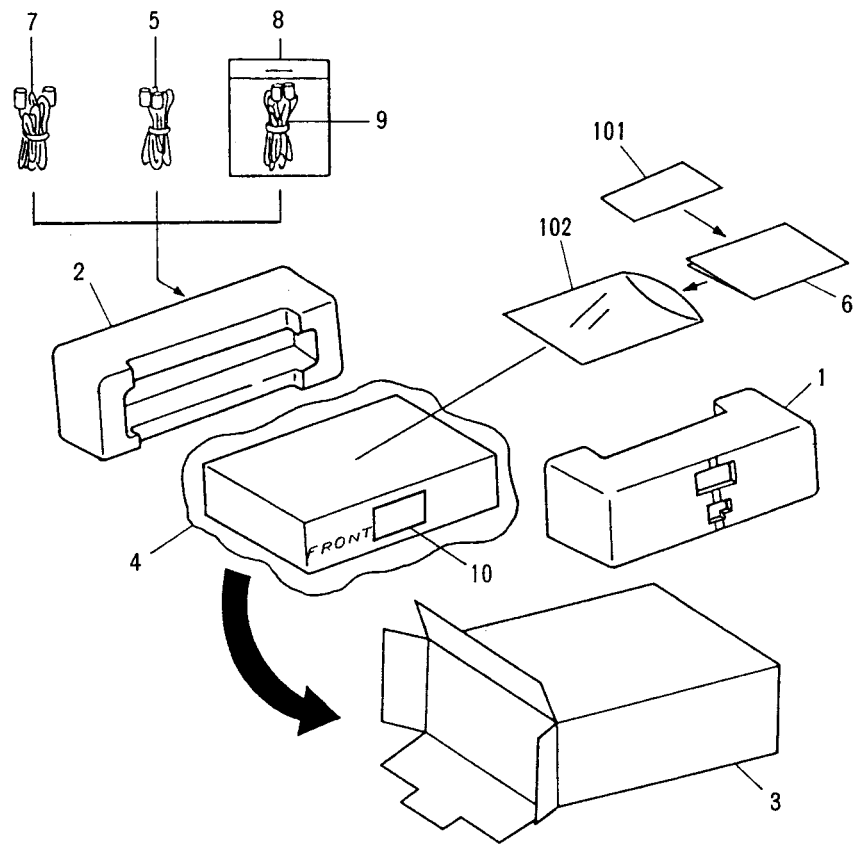
	6	Operating instructions	RRE1057
	7	Connection cord (with mini plug)	PDE – 319
	8	Connection cord assembly	RDE1002
	9	Connection cord	RDE – 010
	10	Sheet (For transportation)	RHC1028
NSP	101	Warranty card	ARY1026
NSP	102	Vinyl bag	RHL – 018



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⚠	4	T1 power transformer	RTT1203
⊙	5	Mechanism unit	RYM1161
	6	Absorb plate (B)	PNB1109
	7	Door spring	RBH1306
	8	Cushion	REB1174
	9	Protector	RED1020
	10	Cord clamper	RNH – 184
	11	Panel stay	RNT1142
	12	Name plate	AAM1001
	13	Screw	ABA1148
	14	Foor assembly	AMR1159
	15	LED lens	AMR1160
	16	Side sheet (sponge)	PNM1150
	17	Lens S	PNW1893
	18	Counter reset knob	RAA1009
	19	Slide SW knob	RAC1562
	20	Power button	RAC1703
	21	Balance knob	RAC1705
	22	VR knob	RAC1707
	23	Function knob	RAC1718
	24	FL filter	RAH2087
	25	VR ring	RAT1011
	26	Door sheet (rubber)	REB1191
	27	Side spacer (rubber)	PEB1198
	28	Door lens	RAH1927
	29	FL lens	RAH2032
	30	Side panel	RAH2044
	31	Styrol protector	RHC1028
	32	Screw	BBT30P100FZK
	33	Screw	BBZ26P080FZK
	34	Screw	BBZ30P080FZK
	35	Screw	FBT40P080FZK
	36	Screw	IBZ30P060FCC
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	38	Screw	IBZ30P080FCC
	39	Screw	IBZ30P100FCC
	40	Screw	IBZ40P080FCC
	41	Rivet	RBM – 003
	42	Jack nut	RBN – 006
	43	Cord clamper	REC – 371
	44	Front panel assembly	RXX1513
	45	Door assembly	RXX1515
	46	Bonnet	RXX1516
	47	Fiber washer	VEC1254
NSP	101	ENCODE unit	RWZ2327
NSP	102	DECODE unit	RWZ2328
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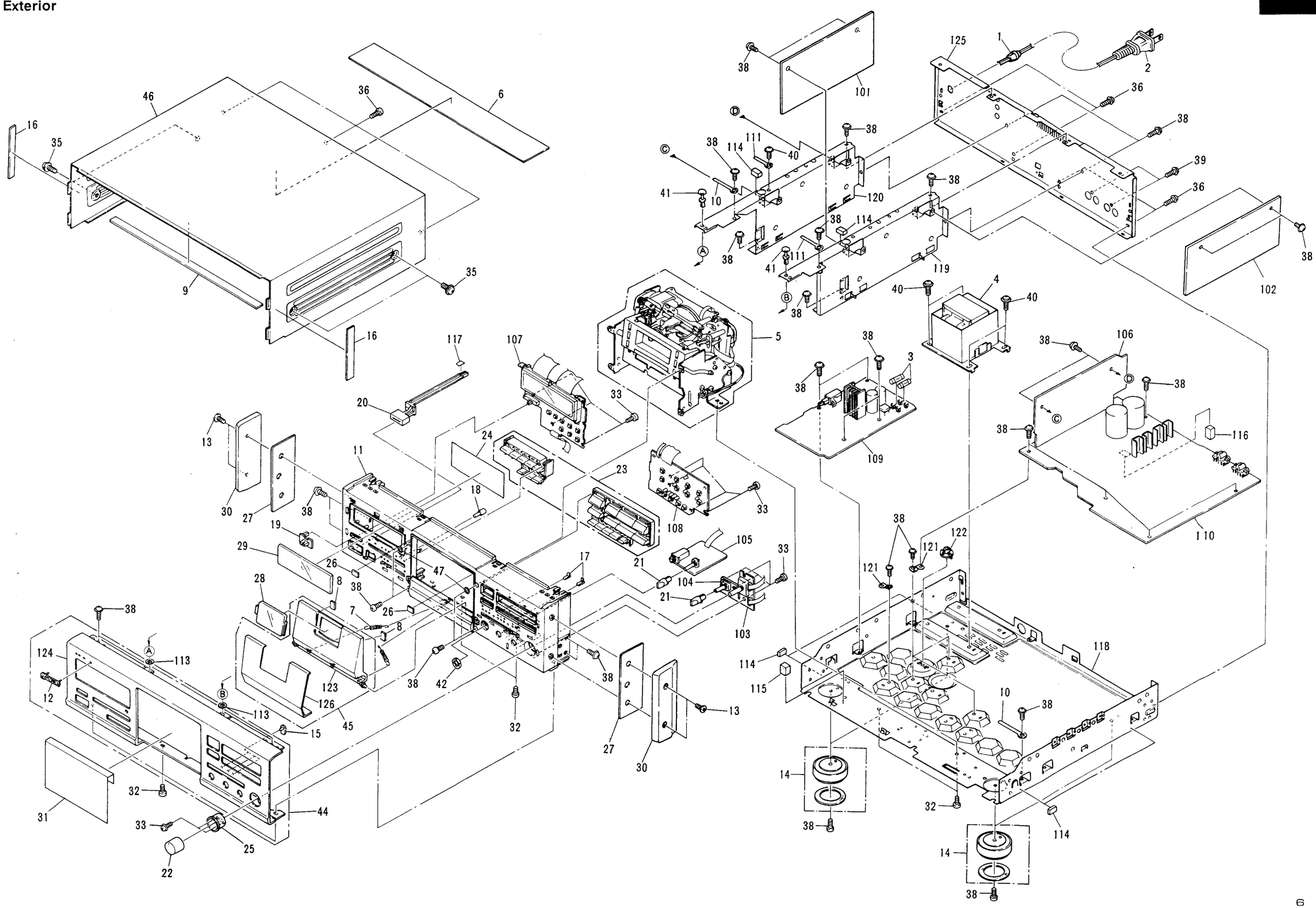
NSP	104	BAL. VR unit	RWZ2334
NSP	105	HEADPHONE unit	RWZ2338
NSP	106	CONTROL unit	RWZ2652
NSP	107	FL unit	RWZ2653
NSP	108	OPERATION unit	RWZ2654
NSP	109	BIAS unit	RWZ2655
NSP	110	MAIN unit	RWX1068
NSP	111	Cord clamper	DNF1128
NSP	112	Binder holder	PNW1021
NSP	113	Washer	RBF1017
NSP	114	Rubber spacer (A)	REB1057
NSP	115	Spacer (rubber)	REB1187
NSP	116	Spacer (rubber)	REB1192
NSP	117	Acetate tape	REH1020
NSP	118	Main chassis	RNB1059
NSP	119	Center stay	RNC1058
NSP	120	Center stay	RNC1059
NSP	121	PCB base	RNE1221
NSP	122	PCB stud	RNL – 792
NSP	123	Door	RNK1820
NSP	124	Front panel	RAH2043
NSP	125	Rear panel	RNA1567
NSP	126	Door panel	RAH2053

Exterior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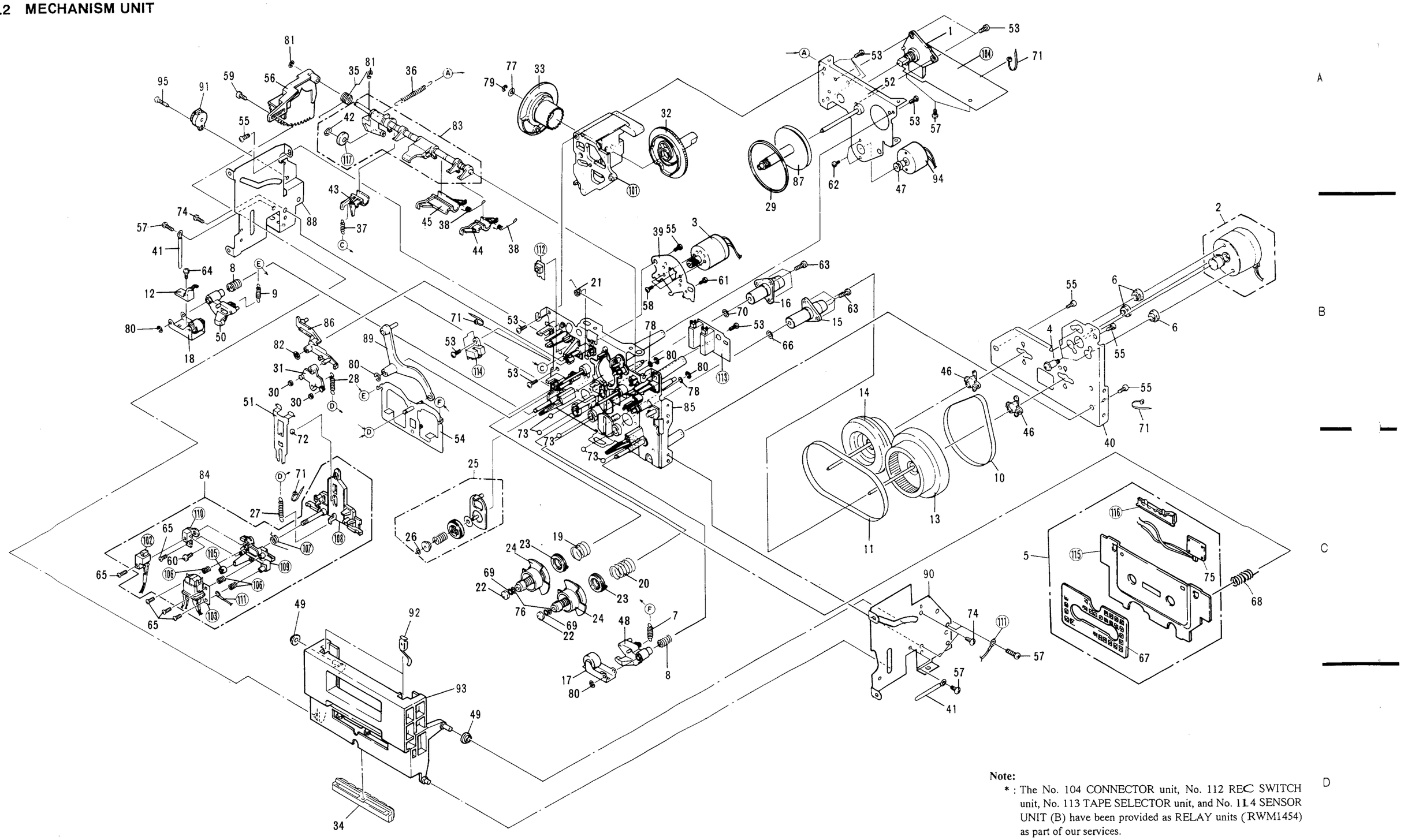
2.2 MECHANISM UNIT



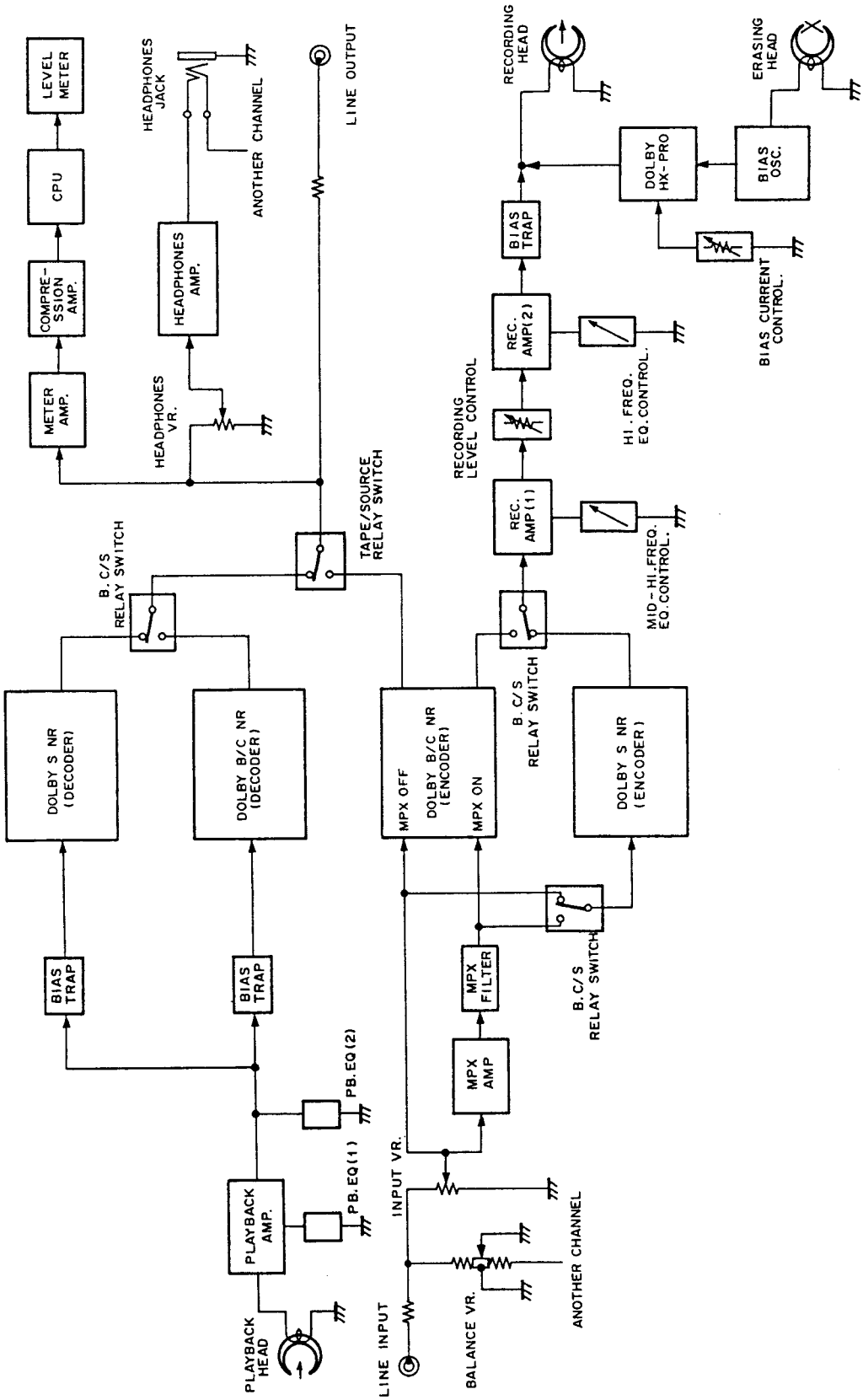
Note:

* : The No. 104 CONNECTOR unit, No. 112 REC SWITCH unit, No. 113 TAPE SELECTOR unit, and No. 114 SENSOR UNIT (B) have been provided as RELAY units (RWM1454) as part of our services.

Parts List

Mark	No.	Description	Part No.
	1	Rotary encoder	RSX1004
	2	Capstan motor assembly	RXX1491
	3	Reel motor assembly	RXM1018
	4	Step screw	RBA – 064
	5	Cassette plate assembly	RXX1064
	6	Rubber cushion	REB1125
	7	Pinch spring	RBL – 028
	8	Pinch thrust spring	RBL – 030
	9	Sub – pinch spring	RBL – 098
	10	Capstan belt	REB1143
	11	Capstan belt (A)	REB – 509
	12	Tape guide	RNK1823
	13	Flywheel assembly	RXA1374
	14	Sub – flywheel assembly	RXA1375
	15	Metal holder assembly (A)	RXA1426
	16	Metal holder assembly (B)	RXA1343
	17	Pinch roller arm (R) assembly	RXB – 876
	18	Pinch roller arm (A) assembly	RXB – 877
	19	BT spring (A)	RBL – 031
	20	BT spring (B)	RBL – 032
	21	Idler pressure spring	RBL – 033
	22	Reel shaft cap (B)	RNK – 815
	23	BT disk assembly	RXB – 751
	24	Reel base assembly	RXB – 874
	25	Take – up idler assembly	RXB – 875
	26	Washer	RBF – 065
	27	Head base spring	RBL – 037
	28	Brake spring	RBL – 038
	29	Drive belt	REB1182
	30	Brake shoe	REB – 511
	31	Brake	RNL – 723
	32	Cam gear	RNK1640
	33	Side cam gear	RNK1765
	34	Stabilizer	REB1161
	35	Eject spring	RBL – 039
	36	Half set arm spring	RBL – 040
	37	REC functioning spring	RBL – 041
	38	Detection functioning spring	RBL – 042
	39	Reel motor mounting plate	RNE1169
	40	Flywheel holder	RNH – 304
	41	Cord clamper	RNH – 184
	42	Washer	RBF – 057
	43	REC detector arm	RNL – 733
	44	Chrom detector arm	RNL – 734
	45	Metal detector arm	RNL – 735
	46	Thrust holder	RNL – 743
	47	Motor pulley	PNW1634
	48	Pressure arm (R)	RNL – 725
	49	Collar	RNL – 742
	50	Pressure arm (L)	RNL – 726
	51	Head base set spring	RBL – 026
	52	Gear chassis assembly	RXA1171
	53	Screw	BBZ26P080FZK
	54	Pinch base assembly	RXB – 878
	55	Screw	BBZ30P080FZK
	56	Eject lever	RNK1763
	57	Screw	BCZ30P060FMC
	58	Screw	BMZ26P030FZK
	59	Screw	BBZ20P060FMC
	60	Screw	BMZ26P060FZK
	61	Screw	BMZ30P080FZK
	62	Screw	PMZ30P040FMC
	63	Screw	PMA26P050FZK
	64	Screw	PMA26P060FZK
	65	Screw	PMZ20P080FZK
	66	Washer	RBF – 030
	67	Stabilizer (B)	REB1038
	68	Earth spring	RBL – 059
	69	Washer	RBF – 076
	70	Washer	RBF1040
	71	Binder	REC – 371
	72	Steel ball (3mm)	REF – 022
	73	Steel ball (4mm)	REF – 023
	74	Screw	VCT30P060FZK
	75	LED (D3)	SLF – 401C
	76	Washer	WA21D040D013
	77	Washer	WA26N070W040
	78	Washer	WA32D080D050
	79	E ring	YE20FUC
	80	E ring	YE25FUC
	81	E ring	YE30FUC
	82	Snap ring	YS24FBT
	83	Shift shaft assembly	RXB – 885
	84	Head base assembly	RXX1523
	85	Mechanism chassis assembly	RXA1366
	86	Brake lever	RNK1638
	87	Second pulley assembly	RXA1350
	88	Door frame (L)	RNE1475
	89	Pinch lever assembly	RXA1360
	90	Door frame (R)	RNE1476
	91	Damper assembly	VXA1153
	92	Half pressure spring	RBK1004
	93	Door pocket	RNK1764
	94	Loading motor	VXM1034
	95	Screw	PBZ20P060FMC
NSP	101	Gear base assembly	RXB – 882
NSP	102	E head	RPB1042
NSP	103	R & P head	RPB1041
NSP	104	Connector unit	RWZ2459*
NSP	105	Adjustment nut	RBA1047
NSP	106	Headd adjustment spring C	RBL – 034
NSP	107	Hight spring	RBL – 036
NSP	108	Head base	RNG – 334
NSP	109	Sub – head base	RNG – 335
NSP	110	E head base	RNG1033
NSP	111	Earth lead assembly	RDF – 001
NSP	112	REC switch unit	RWZ2557*
NSP	113	Tape selector unit	RWZ2458*
NSP	114	Sensor unit (B)	RWZ2460*
NSP	115	Cassette plate	RAH1306
NSP	116	Lead wire holder	RNL – 793
NSP	117	Shift roller	RNL – 731

4. BLOCK DIAGRAM



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	6	Rubber cushion	REB1125
	7	Pinch spring	RBL – 028
	8	Pinch thrust spring	RBL – 030
	9	Sub – pinch spring	RBL – 098
	10	Capstan belt	REB1143
	11	Capstan belt (A)	REB – 509
	12	Tape guide	RNK1823
	13	Flywheel assembly	RXA1374
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	16	Metal holder assembly (B)	RXA1343
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	23	BT disk assembly	RXB – 751
	24	Reel base assembly	RXB – 874
	25	Take – up idler assembly	RXB – 875
	26	Washer	RBF – 065
	27	Head base spring	RBL – 037
	28	Brake spring	RBL – 038
	29	Drive belt	REB1182
	30	Brake shoe	REB – 511
	31	Brake	RNL – 723
	32	Cam gear	RNK1640
	33	Side cam gear	RNK1765
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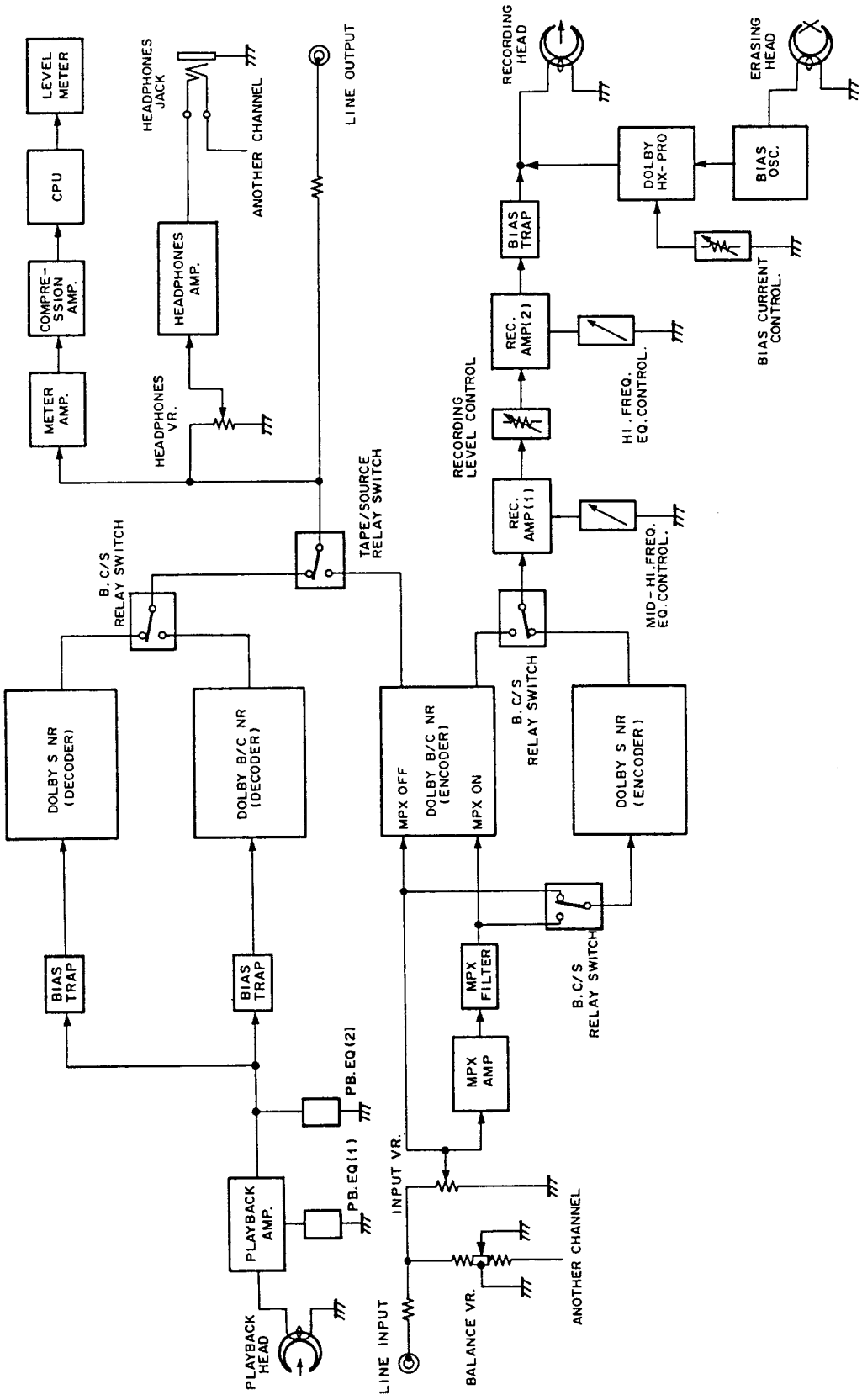
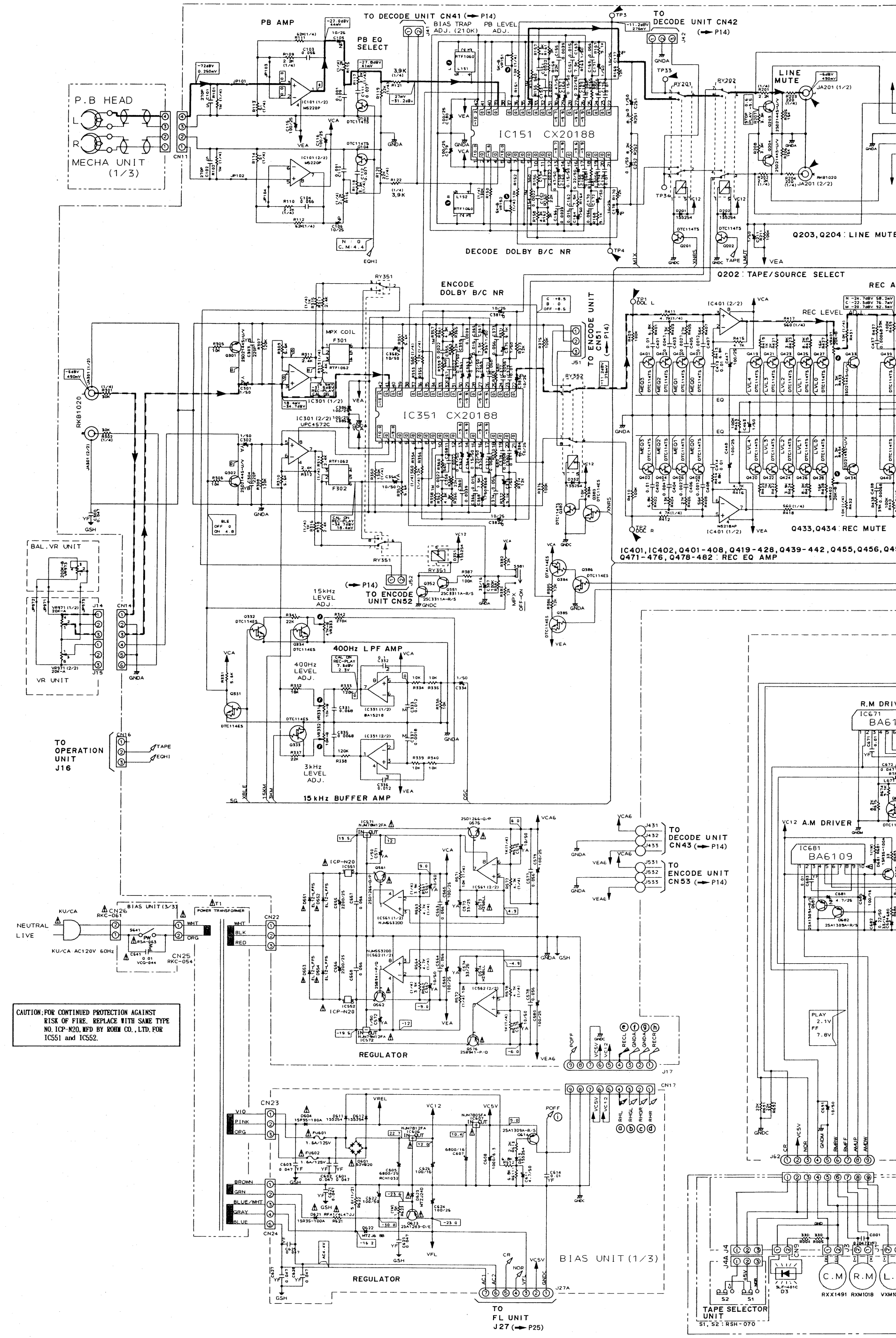
	61	Screw	BMZ30P080FZK
	62	Screw	PMZ30P040FMC
	63	Screw	PMA26P050FZK
	64	Screw	PMA26P060FZK
	65	Screw	PMZ20P080FZK
	66	Washer	RBF – 030
	67	Stabilizer (B)	REB1038
	68	Earth spring	RBL – 059
	69	Washer	RBF – 076
	70	Washer	RBF1040
	71	Binder	REC – 371
	72	Steel ball (3mm)	REF – 022
	73	Steel ball (4mm)	REF – 023
	74	Screw	VCT30P060FZK
	75	LED (D3)	SLF – 401C
	76	Washer	WA21D040D013
	77	Washer	WA26N070W040
	78	Washer	WA32D080D050
	79	E ring	YE20FUC
	80	E ring	YE25FUC
	81	E ring	YE30FUC
	82	Snap ring	YS24FBT
	83	Shift shaft assembly	RXB – 885
	84	Head base assembly	RXX1523
	85	Mechanism chassis assembly	RXA1366
	86	Brake lever	RNK1638
	87	Second pulley assembly	RXA1350
	88	Door frame (L)	RNE1475
	89	Pinch lever assembly	RXA1360
	90	Door frame (R)	RNE1476
	91	Damper assembly	VXA1153
	92	Half pressure spring	RBK1004
	93	Door pocket	RNK1764
	94	Loading motor	VXM1034
	95	Screw	PBZ20P060FMC
NSP	101	Gear base assembly	RXB – 882
NSP	102	E head	RPB1042
NSP	103	R & P head	RPB1041
NSP	104	Connector unit	RWZ2459*
NSP	105	Adjustment nut	RBA1047
NSP	106	Headd adjustment spring C	RBL – 034
NSP	107	Hight spring	RBL – 036
NSP	108	Head base	RNG – 334
NSP	109	Sub – head base	RNG – 335
NSP	110	E head base	RNG1033
NSP	111	Earth lead assembly	RDF – 001
NSP	112	REC switch unit	RWZ2557*
NSP	113	Tape selector unit	RWZ2458*
NSP	114	Sensor unit (B)	RWZ2460*
NSP	115	Cassette plate	RAH1306
NSP	116	Lead wire holder	RNL – 793
NSP	117	Shift roller	RNL – 731

4. BLOCK DIAGRAM



5. SCHEMATIC AND PCB CONNECTIONS DIAGRAMS



TO DECODE UNIT CN42 (→P14)

LINE MUTE

HEADPHONE UNIT

MUTE

HEADPHONE AMP

M.S.

METER AMP

METER LEVEL ADJ.

Q203, Q204 : LINE MUTE

Q202 : TAPE/SOURCE SELECT

REC AMP

REC LEVEL

Q433, Q434 : REC MUTE

IC401, IC402, Q401-408, Q419-428, Q439-442, Q455, Q456, Q459-462, Q463, Q464, Q471-476, Q478-482 : REC EQ AMP

TO ENCODE UNIT CN51 (→P14)

BIAS OSC

BIAS FREQ ADJ. (105kHz)

BIAS UNIT (2/3)

CONTROL UN

R.M DRIVER

IC671 BA6109

RESET

BIAS CONTROL

IC661 TC4050BP or CD4050B

VC12 A.M DRIVER

IC681 BA6109

Q655 : LINE MUTE

Q656 : REC MUTE

DATA MEMORY

IC652 M6M80011AL

MAIN C.P.U.

IC651 PD4359A

PLAY 2.1V FF 7.8V

IC713 TC4050BP or CD4050B

SIGNAL LEVEL DETECT

TO FL UNIT J29 (→P25)

TO DECODE UNIT CN43 (→P14)

TO ENCODE UNIT CN53 (→P14)

CONNECTOR UNIT

TAPE SELECTOR UNIT

S1, S2 : RSH-070

ENCODER RSX1004

REC SWITCH UNIT RSG-143

SENSOR UNIT (B)

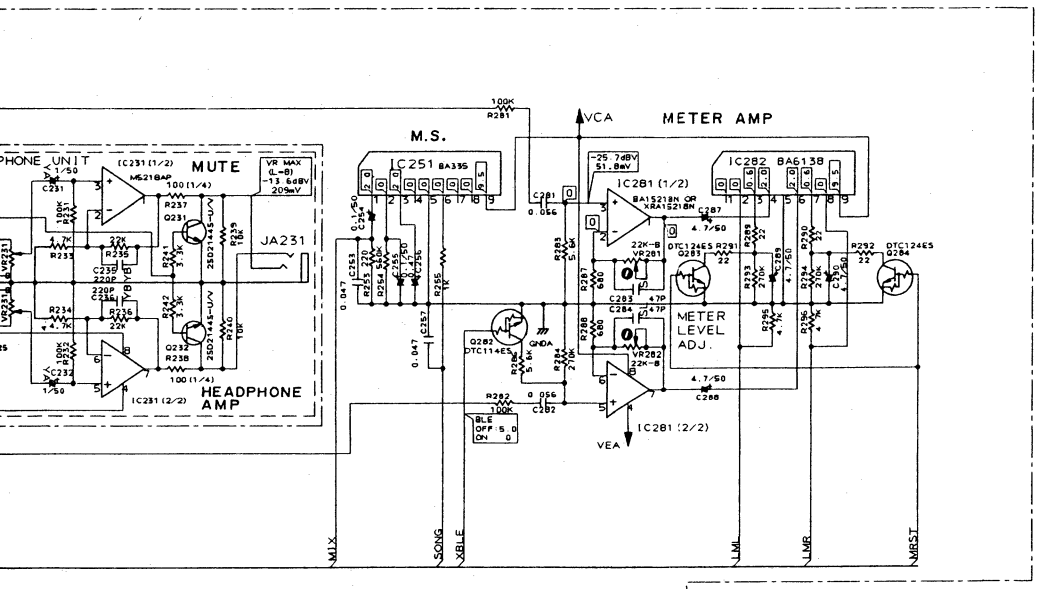
RELAY UNIT (RWM1454)

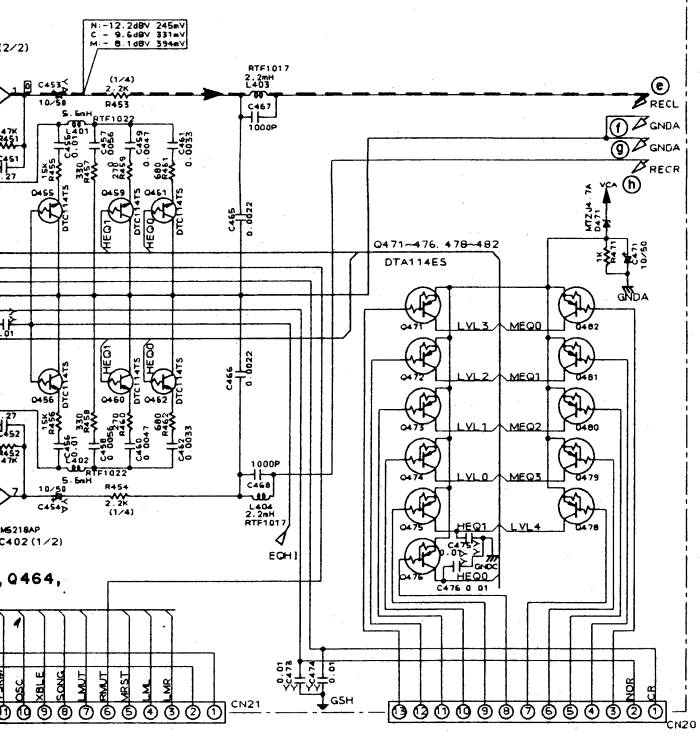
MECHANISM UNIT (3/3) (RYM1161)

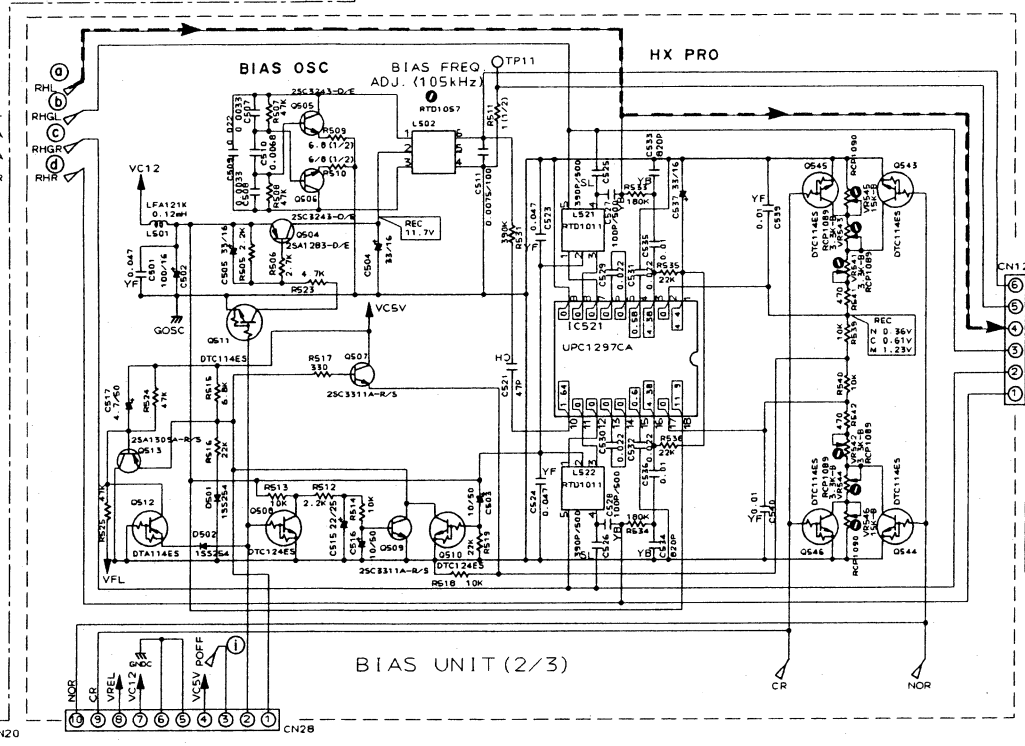
: PLAYBACK

: RECORDIN

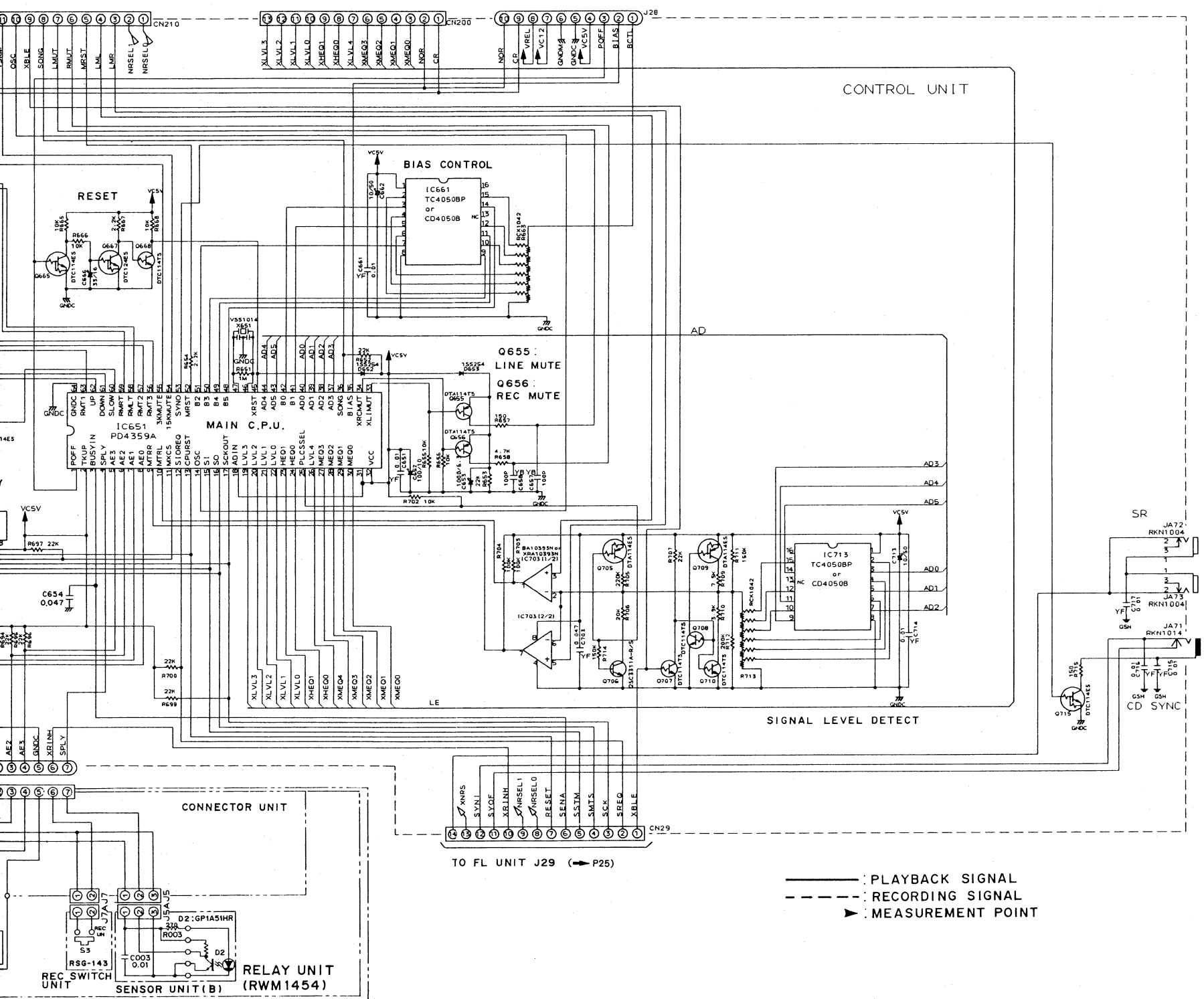
: MEASURE

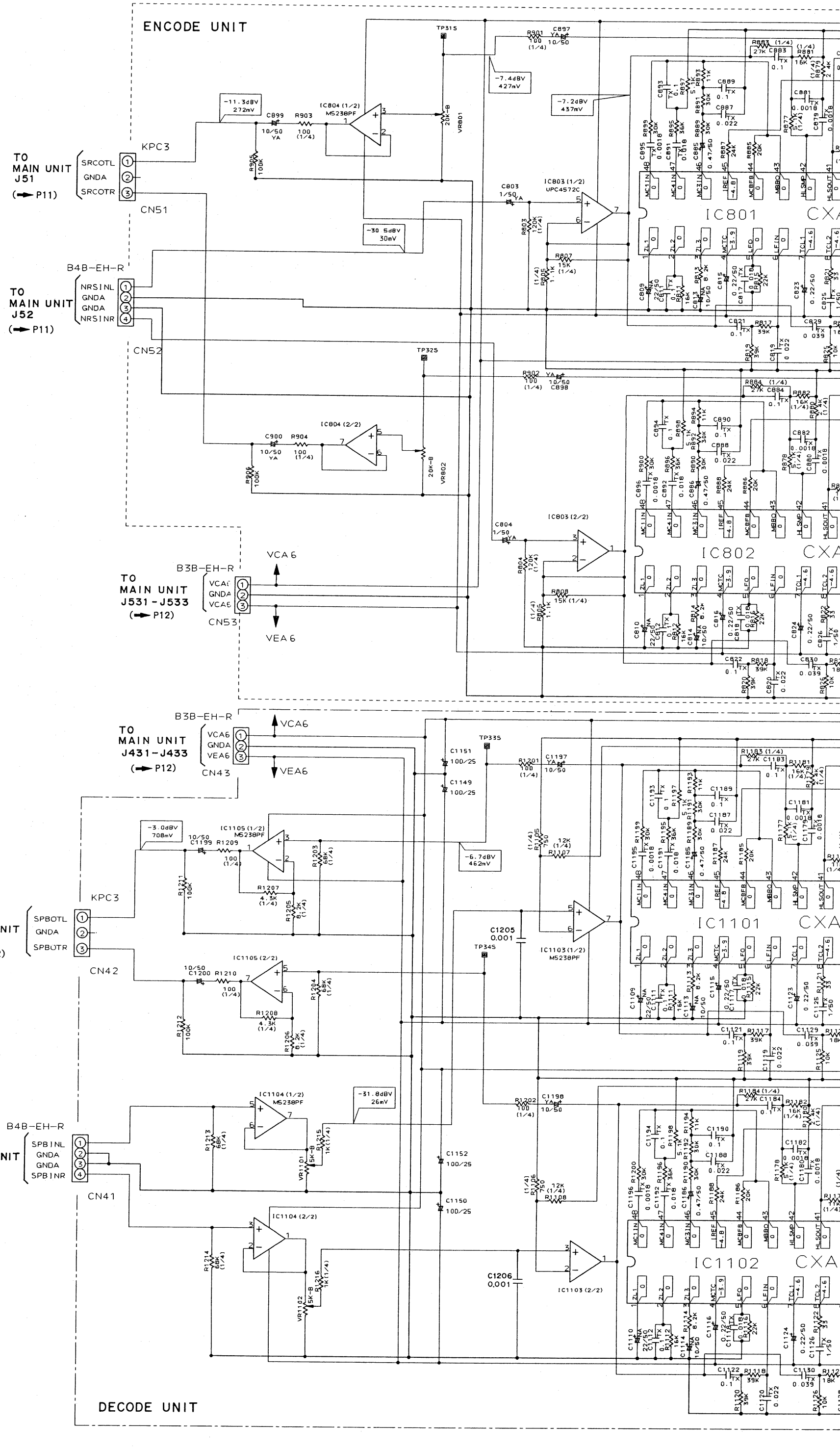


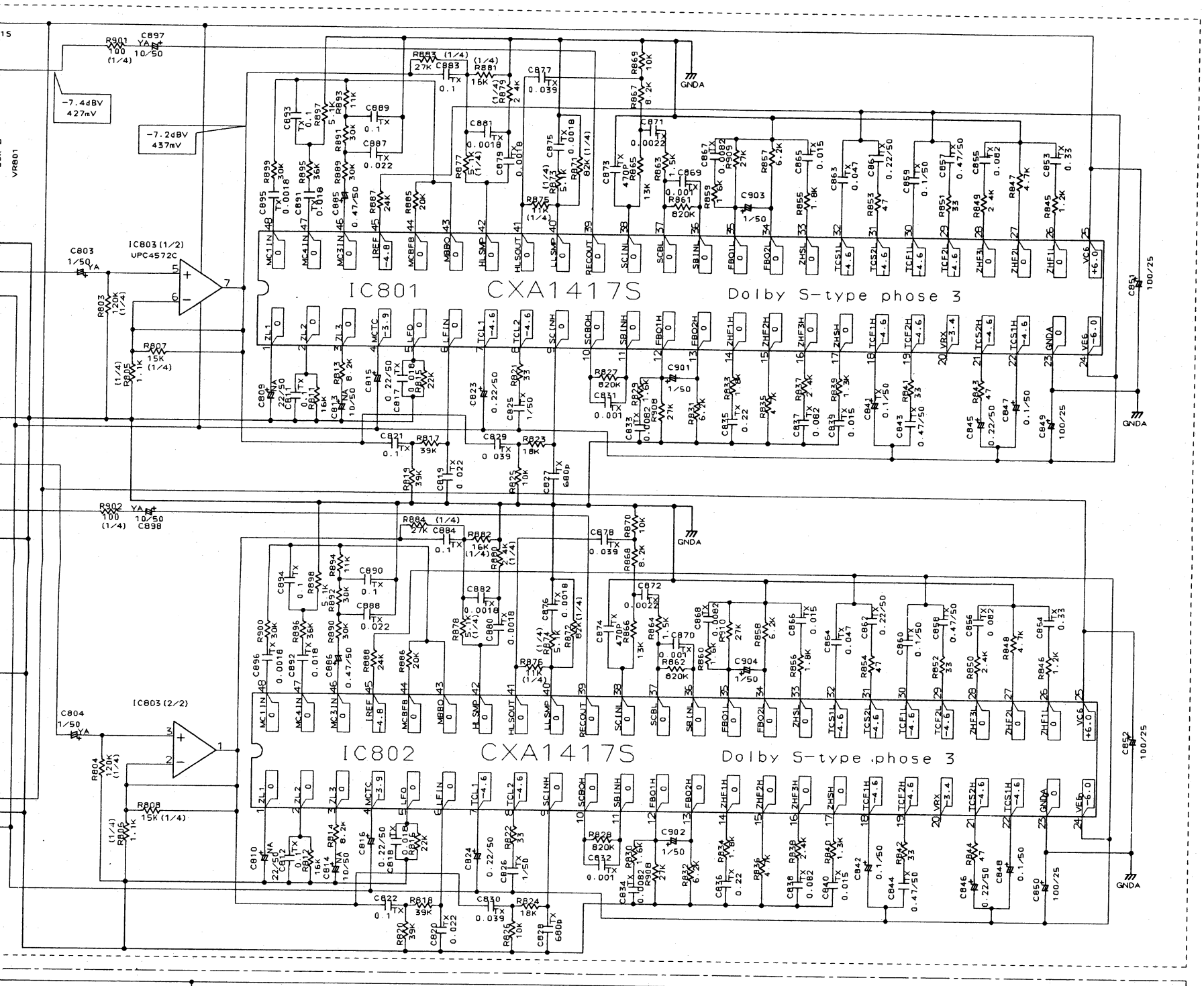




	Lch	Rch
TYPE I	VR541	VR542
TYPE II	VR543	VR544
TYPE IV	VR545	VR546




ENCODE UNIT
TO MAIN UNIT J51 (➡ P11)
KPC3
SRCOTL
GNDA
SRCOTR
CN51
B4B-EH-R
TO MAIN UNIT J52 (➡ P11)
NRSINL
GNDA
GNDA
NRSINR
CN52
B3B-EH-R
TO MAIN UNIT J531 - J533 (➡ P12)
VCA6
GNDA
VEA6
CN53
VCA 6
VEA 6
B3B-EH-R
TO MAIN UNIT J431 - J433 (➡ P12)
VCA6
GNDA
VEA6
CN43
VCA6
VEA6
TO MAIN UNIT J42 (➡ P12)
KPC3
SPBOTL
GNDA
SPBOTR
CN42
B4B-EH-R
TO MAIN UNIT J41 (➡ P11)
SPBINL
GNDA
GNDA
SPBINR
CN41
DECODE UNIT
TP31S
TP32S
TP33S
TP34S
-11.3dBV 272mV
-7.4dBV 427mV
-7.2dBV 437mV
-30.5dBV 30mV
-3.0dBV 708mV
-6.7dBV 462mV
-31.8dBV 26mV
IC804 (1/2) M5238PF
IC804 (2/2)
IC803 (1/2) UPC4572C
IC803 (2/2)
IC1105 (1/2) M5238PF
IC1105 (2/2)
IC1104 (1/2) M5238PF
IC1104 (2/2)
IC1103 (1/2) M5238PF
IC1103 (2/2)
VR801
VR802
VR1101
VR1102
IC801 CXA
IC802 CXA
IC1101 CXA
IC1102 CXA



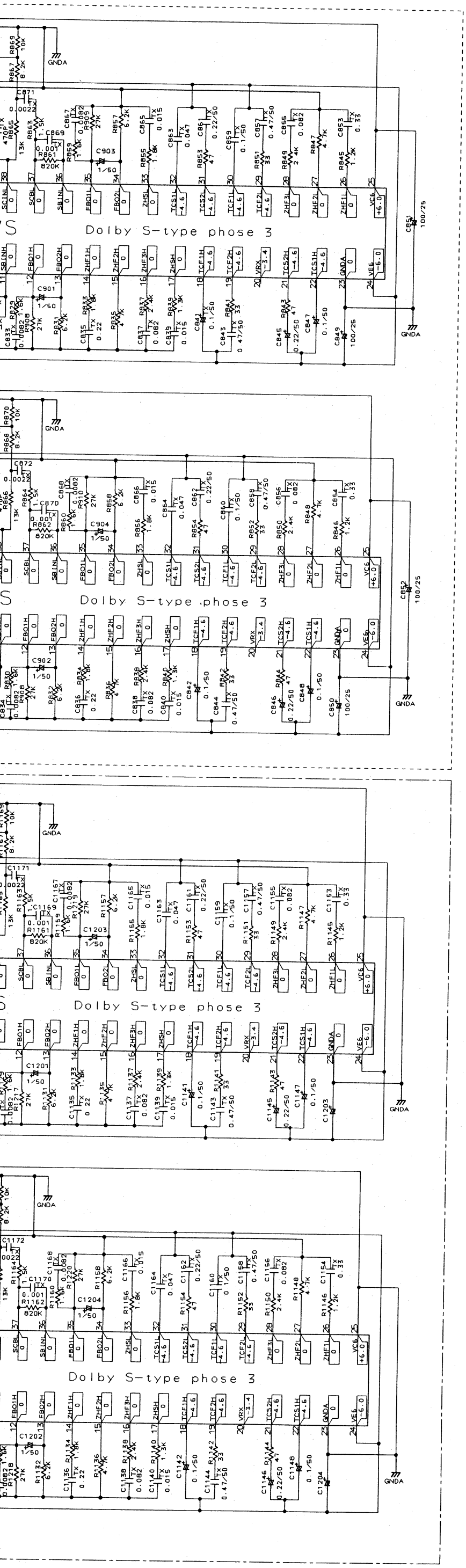
Note:

1. **When ordering service pa "PARTS LIST of EXPLOD PARTS LIST".**
2. **Since these are basic circuits, values of some components ma ment.**
3. **RESISTORS:**
   Unit: k:kΩ, M:MΩ, or Ω unless oth
   Rated power: 1/4W, 1/6W, 1/8 noted.
   Tolerance: (F): ±1%, (G): ±2%, (K): less otherwise noted.
4. **CAPACITORS:**
   Unit: p:pF or μF unless otherwise
   Ratings: capacitor (μF)/ voltage (V
   Rated voltage: 50V except for elec
5. **COILS:**
   Unit: m:mH or μH unless otherwis
6. **VOLTAGE AND CURRENT:**
   ▭ : DC voltage (V) in STOP mo
   ⇦ mA or ← mA: DC current in S noted.
7. **OTHERS:**
   - ➡ : Signal route.
   - ⊘ : Adjusting point.
   - ▼ (Red) : Measurement point.
   - The ⚠ mark found on some comp portance of the safety factor of th placing, be sure to use parts of id
8. **SWITCHES** (Underline indicates sv

BIAS UNIT
S641 : POWER ON – OFF

FL UNIT
S721 : BLE (FLAT) S/C
S722 : METER RANGE
S723 : RESET
S724 : BIAS DOWN
S725 : PEAK MODE
S726 : COUNTER MODE
S727 : BIAS UP
S728 : TAPE RETURN
S729 : DISPLAY OFF
S735 : PLAY – OFF – REC

OPERATION UNIT
S781 : DOLBY S
S782 : DOLBY B/C
S783 : NR OFF
S784 : MONITOR
S785 : REC/MUTE
S786 : PAUSE
S787 : REC
S788 : OPEN/CLOSE
S789 : FF
S790 : PLAY
S791 : REW
S792 : STOP
S793 : CD SYNC



Note: (Type 6)

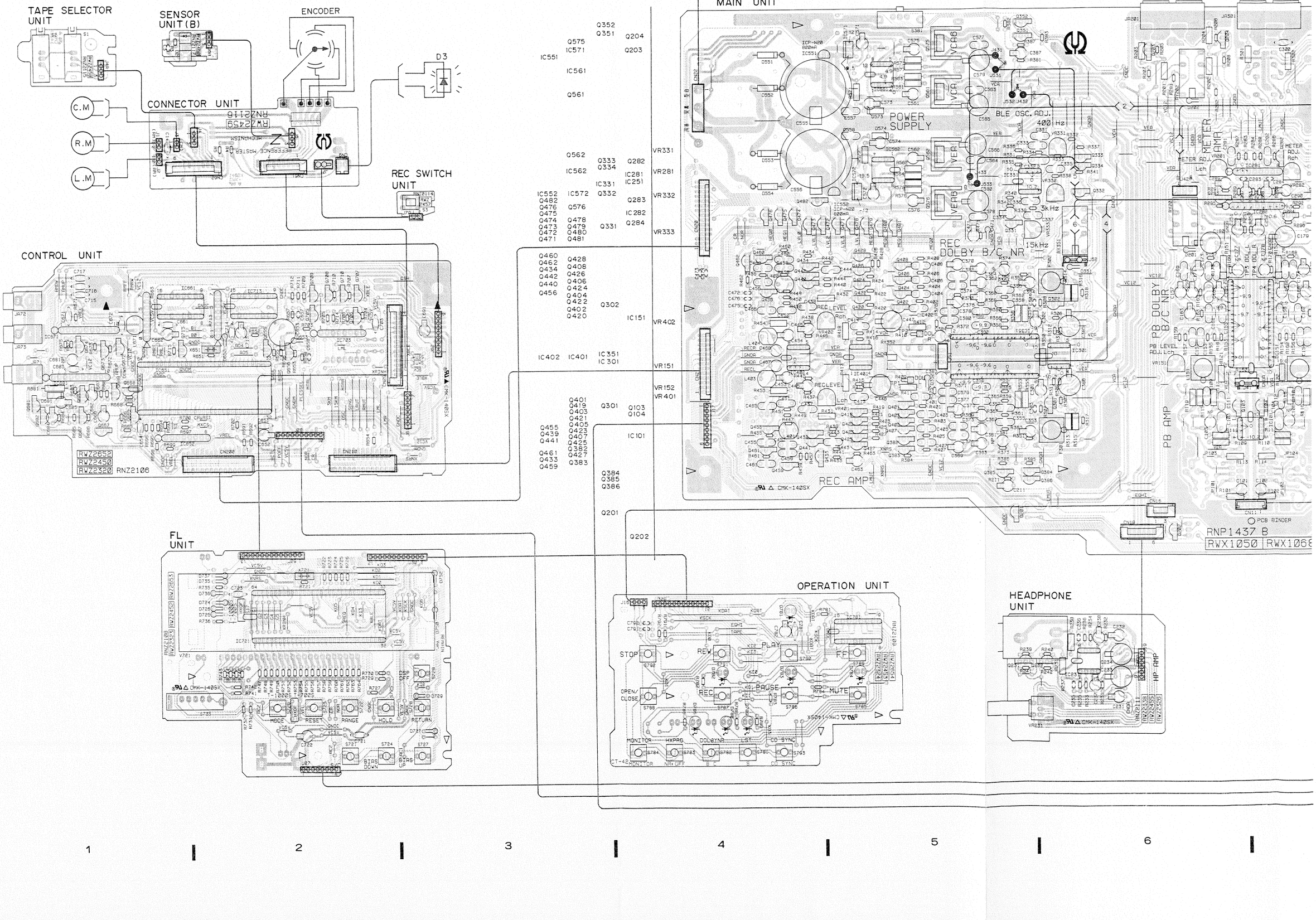
1. **When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".**
2. **Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.**
3. **RESISTORS:**
   Unit: k:kΩ, M:MΩ, or Ω unless otherwise noted.
   Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.
   Tolerance: (F): ±1%, (G): ±2%, (K): ±10%, (M): ±20% or ±5% unless otherwise noted.
4. **CAPACITORS:**
   Unit: p:pF or μF unless otherwise noted.
   Ratings: capacitor (μF)/ voltage (V) unless otherwise noted.
   Rated voltage: 50V except for electrolytic capacitors.
5. **COILS:**
   Unit: m:mH or μH unless otherwise noted.
6. **VOLTAGE AND CURRENT:**
   ▭ : DC voltage (V) in STOP mode unless otherwise noted.
   ⇨ mA or ← mA : DC current in STOP mode unless otherwise noted.
7. **OTHERS:**
   - ➡ : Signal route.
   - ⊘ : Adjusting point.
   - ▼ (Red) : Measurement point.
   - The ⚠ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.
8. **SWITCHES** (Underline indicates switch position):

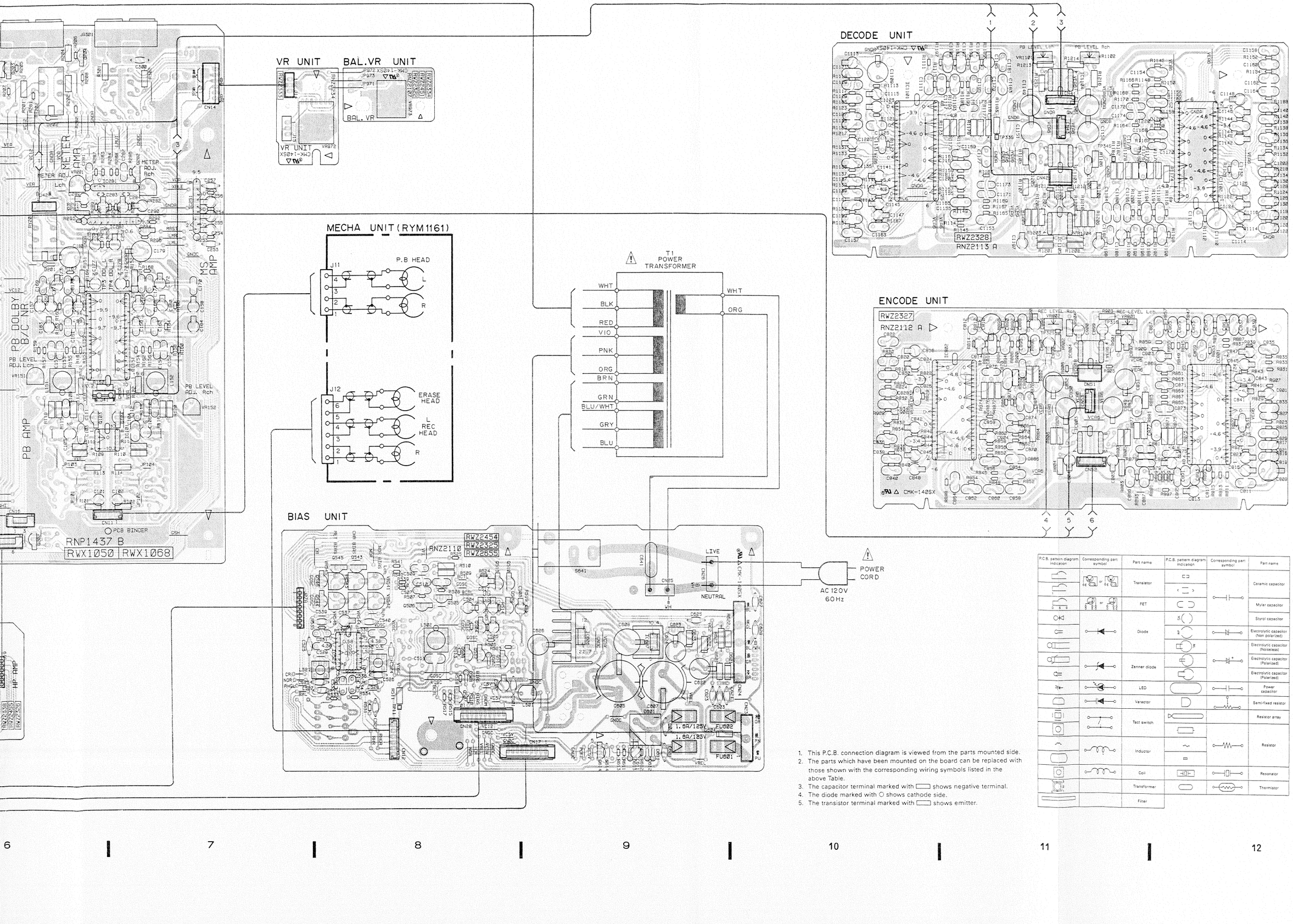
BIAS UNIT
S641 : POWER ON – OFF

FL UNIT
S721 : BLE (FLAT) S/C
S722 : METER RANGE
S723 : RESET
S724 : BIAS DOWN
S725 : PEAK MODE
S726 : COUNTER MODE
S727 : BIAS UP
S728 : TAPE RETURN
S729 : DISPLAY OFF
S735 : PLAY – OFF – REC

OPERATION UNIT
S781 : DOLBY S
S782 : DOLBY B/C
S783 : NR OFF
S784 : MONITOR
S785 : REC/MUTE
S786 : PAUSE
S787 : REC
S788 : OPEN/CLOSE
S789 : FF
S790 : PLAY
S791 : REW
S792 : STOP
S793 : CD SYNC

• View from component side





1. This P.C.B. connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the above Table.
3. The capacitor terminal marked with ▭ shows negative terminal.
4. The diode marked with ○ shows cathode side.
5. The transistor terminal marked with ▭ shows emitter.

P.C.B. pattern diagram indication	Corresponding part symbol	Part name	P.C.B. pattern diagram indication	Corresponding part symbol	Part name
		Transistor			Ceramic capacitor
		FET			Mylar capacitor
		Diode			Styrol capacitor
					Electrolytic capacitor (Non polarized)
					Electrolytic capacitor (Noiseless)
		Zenner diode			Electrolytic capacitor (Polarized)
					Electrolytic capacitor (Polarized)
		LED			Power capacitor
		Varactor			Semi-fixed resistor
		Tact switch			Resistor array
					Resistor
		Inductor			
		Coil			Resonator
		Transformer			Thermistor
		Filter			

BIAS UNIT

MECHA UNIT(MYM181)

AV UNIT

BAL.AV UNIT

ENCODE UNIT

DECODE UNIT

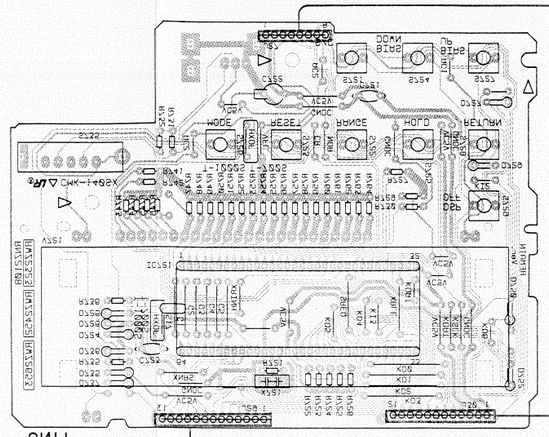
TRANSFORMER POWER

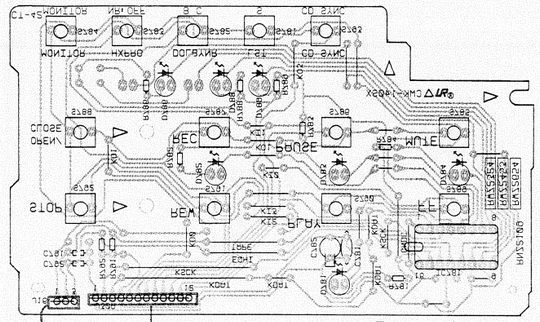
AC 120V/230V

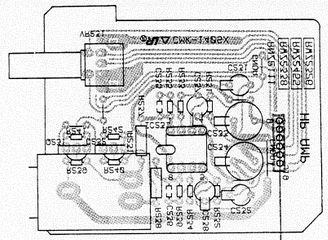
POWER CORD

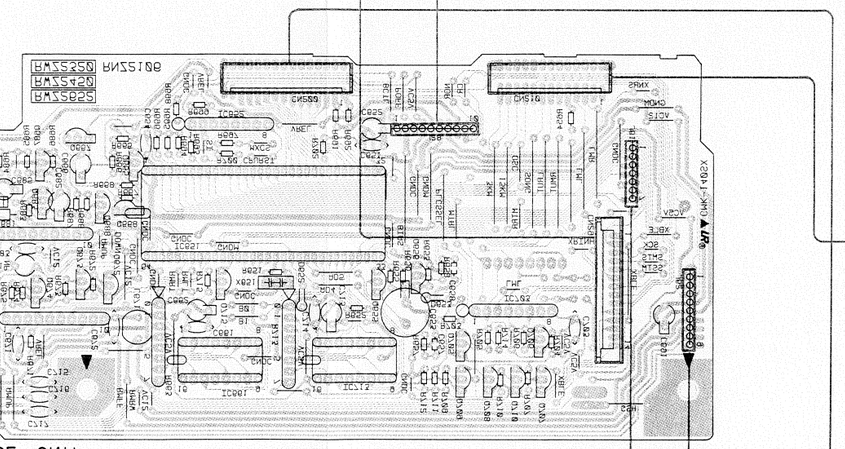
NEUTRAL

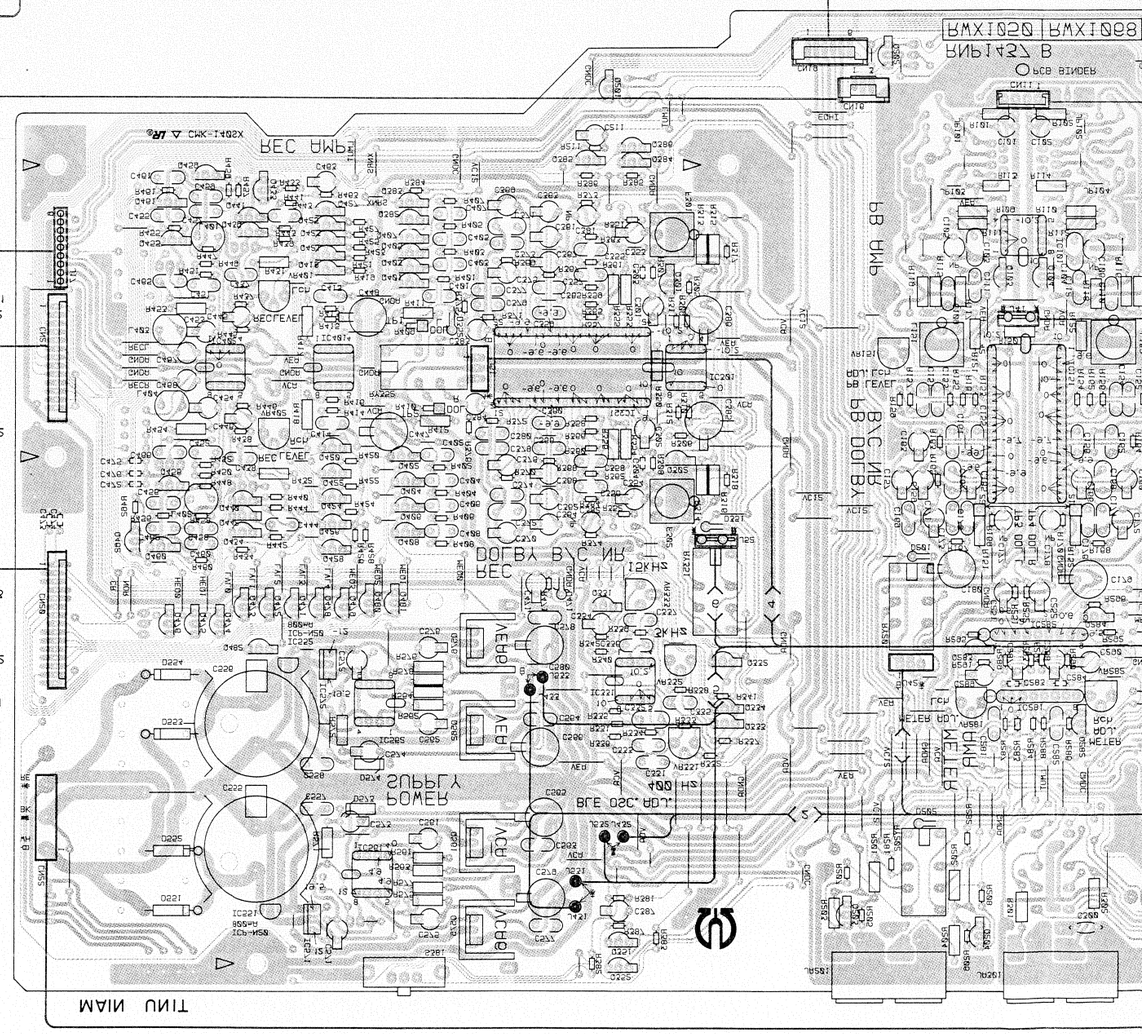
LIVE

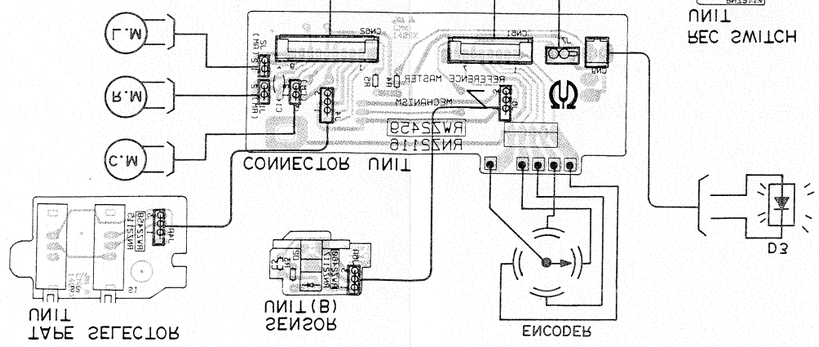












• View from soldering side

TO
CONTROL UNIT CN29 (➡ P13)

J29

SRIN XNRS SYNI SYOF XRINH NRSEL1 NRSEL0 RESET SENA SSTM SMTS SCK SREQ XBLE

VC5V

C723 0.01

KY

IC721
PD3198A
SUB C.P.U.

NRSEL1 NRSEL0 XNRS GND RESET KI3 KI2 KI1 KI0 KO6 KO5 KO4 KO3 KO2 KO1 KO0 XCREQ BUSY SO SI SCKIN

CR NOR XRINH XREMOT SREQ SYIN SYOF XTPB XTRC KSCK KDAT XBLE PBMUT VCC

REMAIN VERSION

D724 1SS254

G5 G4 G3 G2 G1 S17 S16 S15 S14 S13 S12 S11 S10 S09 S08 S07 S06 S05 S04 S03 S02 S01 S00

PLAY S735 OFF REC PSH1011

GNDC

V721
RAW1096

AC2 F1 F1 G5 G4 G3 G2 G1 S18 S17 S16 S15 S14 S13 S12 S11 S10 S09 S08 S07 S06 S05 S04 S03 S02 S01 S00 F2 F2 AC1 FL

AC1 AC2 CR NOR VFL VC5V GNDC

J27

TO
BIAS UNIT (1/3)
CN27 (➡ P11)

KI3 KI2 KI1 KI0 KO3 KO2 KO1 KO0 VC5V KDAT KSCK GNDC

J30

RESET S723 COUNTER MODE S726 DISPLAY OFF S729
METER RANGE S722 PEAK MODE S725 TAPE RETURN S728
BLE (FLAT) S/C S721 BIAS DOWN S724 BIAS UP S727

S721~729 RSG1030

FL UNIT

TO
MAIN UNIT CN16 (➡ P11)

J16

EQH TAPE

IC781
BU2040
LED DRIVER

MUTE RED D784 SEL6C10R
PAUSE ORG D783 SEL6910D
REC RED D782 SEL6C10R
PLAY GRN D781 SEL6410G

J30A

OPERATION UNIT

KS KO3 KO2 KO1 KO0

CD CYNC S793
STOP S792 REW S791 PLAY S790 FF S789
OPEN/CLOSE S788 REC S787 PAUSE S786 REC/MUTE S785
MONITOR S784 NR OFF S783 DOLBY B/C S782 DOLBY S S781

KI3 KI2 KI1 KI0

S781~793 RSG1030

6. PCB PARTS LIST

NOTES:

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%)

560 Ω → 56 × 10¹ → 561 ····· RD1/4PS 5 6 1 J
47k Ω → 47 × 10³ → 473 ····· RD1/4PS 4 7 3 J
0.5 Ω → 0R5 ····· RN2H 0 R 5 K
1 Ω → 010 ····· RS1P 0 1 0 K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω → 562 × 10¹ → 5621 ····· RN1/4SR 5 6 2 1 F

Mark	No.	Description	Part No.

LIST OF ASSEMBLIES

NSP	MAIN UNIT	RWX1068
NSP	VR UNIT	RWZ2333
NSP	BAL. VR UNIT	RWZ2334
NSP	HEADPHONE UNIT	RWZ2338
NSP	CONTROL UNIT	RWZ2652
NSP	FL UNIT	RWZ2653
NSP	OPERATION UNIT	RWZ2654
NSP	BIAS UNIT	RWZ2655
NSP	ENCODE UNIT	RWZ2327
NSP	DECODE UNIT	RWZ2328
	RELAY UNIT	RWM1454
NSP	├ REC SWITCH UNIT	RWZ2457
NSP	├ TAPE SELECTOR UNIT	RWZ2458
NSP	├ CONNECTOR UNIT	RWZ2459
NSP	└ SENSOR UNIT(B)	RWZ2460

MAIN UNIT

SEMICONDUCTORS

	IC101 OP-AMP-IC	M5220P
	IC151 DOLBY-B, C IC	CX20188
	IC251 IC	BA335
	IC281 IC	BA15218N
	IC282 AMP IC	BA6138
	IC301 OP-AMP IC	UPC4572C
	IC331 OP-AMP IC	BA15218
	IC351 DOLBY-B, C IC	CX20188
	IC401, 402 OP-AMP, IC	M5218AP
⚠	IC551, 552 IC PROTECTOR	ICP-N20
	IC561, 562 OP-AMP IC	NJM5532DD
⚠	IC571 REGULATOR IC	NJM78M12FA
⚠	IC572 REGULATOR IC	NJM79M12FA
	Q103, 104 DIGITAL TRANSISTOR	DTC114TS
	Q201, 202 DIGITAL TRANSISTOR	DTC114TS
	Q203, 204 TRANSISTOR	2SD2144S
	Q282 TRANSISTOR	DTC114ES
	Q283, 284 TRANSISTOR	DTC124ES
	Q301, 302 TRANSISTOR	2SD2144S
	Q331-334 TRANSISTOR	DTC114ES
	Q351, 352 TRANSISTOR	2SC3311A
	Q382 DIGITAL TRANSISTOR	DTC114TS
	Q383 TRANSISTOR	DTC114ES
	Q384 DIGITAL TRANSISTOR	DTA114ES
	Q385, 386 TRANSISTOR	DTC114ES
	Q401-408 DIGITAL TRANSISTOR	DTC114TS
	Q419-428 DIGITAL TRANSISTOR	DTC114TS
	Q433, 434 TRANSISTOR	2SD2144S
	Q439-442 DIGITAL TRANSISTOR	DTC114TS
	Q455, 456 DIGITAL TRANSISTOR	DTC114TS
	Q459-462 DIGITAL TRANSISTOR	DTC114TS
	Q471-476 DIGITAL TRANSISTOR	DTA114ES
	Q478-482 DIGITAL TRANSISTOR	DTA114ES
⚠	Q561 TRANSISTOR	2SD1266
⚠	Q562 TRANSISTOR	2SB941
⚠	Q575 TRANSISTOR	2SD1266
⚠	Q576 TRANSISTOR	2SB941
	D201, 202 DIODE	1SS254
	D351, 352 DIODE	1SS254
	D471 ZENER DIODE	MTZJ4.7A
⚠	D551-554 DIODE	EL1Z-LFF5
⚠	D573, 574 ZENER DIODE	HZ5BLL

SWITCHES

	S381 SLIDE SW	RSH1040

RELAYS

	RY201, 202 RELAY	RSR1026
	RY351, 352 RELAY	RSR1026

COILS/TRANSFORMERS

	L151, 152 COIL	RTF1060
	L401, 402 COIL (5.6 mH)	RTF1022
	L403, 404 COIL (2.2 mH)	RTF1017
	F301, 302 MPX FILTER	RTF1062

CAPACITORS

	C101, 102 PL. STYRENE CAPACITOR	CQSF271J50
	C103, 104 AUDIO FILM CAPACITOR	CFTXA563J50
	C105, 106 ELECTR. CAPACITOR	RCH1037
	C109, 110 AUDIO FILM CAPACITOR	CFTXA102J50
	C111, 112 AUDIO FILM CAPACITOR	CFTXA273J50
	C115, 116 ELECTR. CAPACITOR	PCH1076
	C151-154 AUDIO FILM CAPACITOR	CFTXA222J50
	C155, 156 AUDIO FILM CAPACITOR	CFTXA392J50
	C157, 158 ELECT. CAPACITOR	CEASR47M50
	C159, 160 ELECT. CAPACITOR	CEASR15M50
	C161, 162 AUDIO FILM CAPACITOR	CFTXA153J50
	C163, 164 ELECT. CAPACITOR	CEAS010M50
	C165, 166 ELECT. CAPACITOR	CEASR22M50
	C167, 168 AUDIO FILM CAPACITOR	CFTXA683J50
	C169, 170 AUDIO FILM CAPACITOR	CFTXA563J50
	C171, 172 ELECT. CAPACITOR	CEAS010M50
	C173, 174 AUDIO FILM CAPACITOR	CFTXA562J50
	C175, 176 AUDIO FILM CAPACITOR	CFTXA103J50
	C177, 178 ELECTR. CAPACITOR	RCH1037
	C179, 180 ELECTR. CAPACITOR	PCH1076
	C211 ELECT. CAPACITOR	CEAS010M50
	C251, 252 ELECT. CAPACITOR	CEASR10M50
	C253 AUDIO FILM CAPACITOR	CFTXA473J50
	C254, 255 ELECT. CAPACITOR	CEASR10M50
	C256 ELECT. CAPACITOR	CEASR47M50
	C257 AUDIO FILM CAPACITOR	CFTXA473J50
	C281, 282 AUDIO FILM CAPACITOR	CFTXA563J50
	C283, 284 AXIAL CAPACITOR	CCPUSL470J50
	C287-290 ELECT. CAPACITOR	CEAS4R7M50
	C300 CERAMIC CAPACITOR	CKCYF473Z50
	C301, 302 ELECTR. CAPACITOR	CEYA010M50
	C303, 304 AXIAL CAPACITOR	CKPUYB221K50
	C331 AUDIO FILM CAPACITOR	CFTXA683J50
	C332 MYLAR FILM CAPACITOR	CQMA104J50
	C333 MYLAR FILM CAPACITOR	CQMA123J50
	C334 ELECT. CAPACITOR	CEAS010M50
	C335 AUDIO FILM CAPACITOR	CFTXA682J50
	C336 MYLAR FILM CAPACITOR	CQMA123J50
	C337 MYLAR FILM CAPACITOR	CQMA182J50
	C353, 354 ELECTR. CAPACITOR	CEYA100M50
	C355-358 AUDIO FILM CAPACITOR	CFTXA222J50
	C359, 360 AUDIO FILM CAPACITOR	CFTXA392J50
	C361, 362 ELECT. CAPACITOR	CEASR47M50
	C363, 364 ELECT. CAPACITOR	CEASR15M50
	C365, 366 AUDIO FILM CAPACITOR	CFTXA153J50
	C367, 368 ELECT. CAPACITOR	CEAS010M50
	C369, 370 ELECT. CAPACITOR	CEASR22M50
	C371, 372 AUDIO FILM CAPACITOR	CFTXA683J50
	C373, 374 AUDIO FILM CAPACITOR	CFTXA563J50
	C375, 376 ELECT. CAPACITOR	CEAS010M50
	C377, 378 AUDIO FILM CAPACITOR	CFTXA562J50
	C379, 380 AUDIO FILM CAPACITOR	CFTXA103J50
	C381-384 ELECTR. CAPACITOR	RCH1037
	C385, 386 ELECTR. CAPACITOR	PCH1076
	C387 ELECT. CAPACITOR	CEAS330M16
	C401, 402 AUDIO FILM CAPACITOR	CFTXA103J50
	C403, 404 AUDIO FILM CAPACITOR	CFTXA472J50
	C405, 406 AUDIO FILM CAPACITOR	CFTXA272J50
	C407, 408 AUDIO FILM CAPACITOR	CFTXA122J50
	C413, 414 AUDIO FILM CAPACITOR	CFTXA103J50
	C437, 438 AUDIO FILM CAPACITOR	CFTXA681J50
	C443, 444 AUDIO FILM CAPACITOR	CFTXA392J50
	C445, 446 ELECTR. CAPACITOR	CEYA010M50
	C447, 448 ELECTR. CAPACITOR	PCH1076
	C451, 452 AUDIO FILM CAPACITOR	CFTXA274J50
	C453, 454 ELECTR. CAPACITOR	CEYA100M50
	C455, 456 AUDIO FILM CAPACITOR	CFTXA103J50
	C457, 458 AUDIO FILM CAPACITOR	CFTXA562J50
	C459, 460 AUDIO FILM CAPACITOR	CFTXA472J50
	C461, 462 AUDIO FILM CAPACITOR	CFTXA332J50
	C463 ELECT. CAPACITOR	CEAS010M50
	C465, 466 AUDIO FILM CAPACITOR	CFTXA222J50
	C467, 468 AUDIO FILM CAPACITOR	CFTXA102J50
	C471 ELECT. CAPACITOR	CEAS100M50
	C472-476 CERAMIC CAPACITOR	CKPUYY103N16
	C555, 556 ELECTR. CAPACITOR	RCH1036
	C557, 558 AUDIO FILM CAPACITOR	CFTXA563J50
	C561, 562 ELECTR. CAPACITOR	CEYA100M50
	C563, 564 AUDIO FILM CAPACITOR	CFTXA563J50
	C565, 566 ELECTR. CAPACITOR	PCH1076
	C571, 572 ELECTR. CAPACITOR	CEYA010M50
	C573, 574 ELECTR. CAPACITOR	CEYA330M25
	C575, 576 ELECTR. CAPACITOR	CEYA100M50
	C577, 578 AUDIO FILM CAPACITOR	CFTXA563J50
	C579, 580 ELECTR. CAPACITOR	PCH1076

RESISTORS

	R101, 102 CARBONFILM RESISTOR	RD1/4PM□□□J
	R109-122 CARBONFILM RESISTOR	RD1/4PM□□□J
	R150-152 CARBONFILM RESISTOR	RD1/4PM□□□J
	R153-170 CARBONFILM RESISTOR	RD1/6PM□□□J
	R201-204 CARBONFILM RESISTOR	RD1/4PM□□□J
	R205-208 CARBONFILM RESISTOR	RD1/6PM□□□J
	R211 CARBONFILM RESISTOR	RD1/6PM□□□J
	R251-255 CARBONFILM RESISTOR	RD1/6PM□□□J
	R281-284 CARBONFILM RESISTOR	RD1/6PM□□□J
	R286-296 CARBONFILM RESISTOR	RD1/6PM□□□J
	R301, 302 CARBONFILM RESISTOR	RD1/4PM□□□J
	R305-312 CARBONFILM RESISTOR	RD1/6PM□□□J
	R313-316 CARBONFILM RESISTOR	RD1/4PM□□□J
	R317, 318 CARBONFILM RESISTOR	RD1/6PM□□□J
	R331-342 CARBONFILM RESISTOR	RD1/6PM□□□J
	R350 CARBONFILM RESISTOR	RD1/4PM□□□J
	R351, 352 CARBONFILM RESISTOR	RD1/6PM□□□J
	R353-356 CARBONFILM RESISTOR	RD1/4PM□□□J
	R357-376 CARBONFILM RESISTOR	RD1/6PM□□□J
	R381-387 CARBONFILM RESISTOR	RD1/6PM□□□J
	R401-408 CARBONFILM RESISTOR	RD1/6PM□□□J
	R409, 410 CARBONFILM RESISTOR (100 kΩ)	RCN104 3
	R411, 412 CARBONFILM RESISTOR	RD1/4PM□□□J
	R413-416 CARBONFILM RESISTOR	RD1/6PM□□□J
	R417, 418 CARBONFILM RESISTOR	RD1/4PM□□□J
	R419-428 CARBONFILM RESISTOR	RD1/6PM□□□J
	R431, 432 CARBONFILM RESISTOR	RD1/4PM□□□J
	R433, 434 CARBONFILM RESISTOR	RD1/6PM□□□J
	R437-452 CARBONFILM RESISTOR	RD1/6PM□□□J
	R453, 454 CARBONFILM RESISTOR	RD1/4PM□□□J

Mark	No.	Description	Part No.
	R455-463	CARBONFILM RESISTOR	RD1/6PM□□□J
	R471	CARBONFILM RESISTOR	RD1/6PM□□□J
	R561-564	CARBONFILM RESISTOR	RD1/4PM□□□J
	R571, 572	CARBONFILM RESISTOR	RD1/4PM□□□J
	R575-578	CARBONFILM RESISTOR	RD1/4PM□□□J
	VR151, 152	VR (4.7 kΩ)	RCP1020
	VR281, 282	VR (22 kΩ)	RCP1046
	VR331, 332	VR (10 kΩ)	RCP1045
	VR333	VR (47 kΩ)	RCP1047
	VR401, 402	VR (22 kΩ)	RCP1046
OTHERS			
		SCREW	BBZ30P080FCC
		CN14 JUMPER CONNECTOR	KPC6
		CN20, 21 CONNECTOR	TXC-P13P-A1
		J41 CONNECTOR ASSY	RKP1434
		J52 CONNECTOR ASSY	RKP1434
		JA201 JACK	RKB1020
		JA301 JACK	RKB1020

ENCODE UNIT

SEMICONDUCTORS

	IC801, 802		CXA1417S
	IC803	OP-AMP IC	UPC4572C
	IC804	OP AMP	M5238PF

CAPACITORS

	C803, 804	ELECTR. CAPACITOR	CEYA010M50
	C809, 810	ELECT. CAPACITOR	CENA220M50
	C811, 812	AUDIO FILM CAPACITOR	CFTXA104J50
	C813, 814	ELECT. CAPACITOR	CENA100M50
	C815, 816	ELECT. CAPACITOR	CEASR22M50
	C817, 818	AUDIO FILM CAPACITOR	CFTXA183J50
	C819, 820	AUDIO FILM CAPACITOR	CFTXA223J50
	C821, 822	AUDIO FILM CAPACITOR	CFTXA104J50
	C823, 824	ELECT. CAPACITOR	CEASR22M50
	C825, 826	AUDIO FILM CAPACITOR	CFTXA105J50
	C827, 828		CFTXA681J50
	C829, 830	AUDIO FILM CAPACITOR	CFTXA393J50
	C831, 832		CFTXA102J50
	C833, 834	AUDIO FILM CAPACITOR	CFTXA822J50
	C835, 836	AUDIO FILM CAPACITOR	CFTXA224J50
	C837, 838	AUDIO FILM CAPACITOR	CFTXA823J50
	C839, 840	AUDIO FILM CAPACITOR	CFTXA153J50
	C841, 842	ELECT. CAPACITOR	CEASR10M50
	C843, 844	AUDIO FILM CAPACITOR	CFTXA474J50
	C845, 846	ELECT. CAPACITOR	CEASR22M50
	C847, 848	ELECT. CAPACITOR	CEASR10M50
	C849-852	ELECTR. CAPACITOR	RCH1057
	C853, 854	AUDIO FILM CAPADITOR	CFTXA334J50
	C855, 856	AUDIO FILM CAPACITOR	CFTXA823J50
	C857, 858	AUDIO FILM CAPACITOR	CFTXA474J50
	C859, 860	AUDIO FILM CAPACITOR	CFTXA104J50
	C861, 862	AUDIO FILM CAPACITOR	CFTXA224J50
	C863, 864	AUDIO FILM CAPACITOR	CFTXA473J50
	C865, 866	AUDIO FILM CAPACITOR	CFTXA153J50
	C867, 868	AUDIO FILM CAPACITOR	CFTXA822J50
	C869, 870		CFTXA102J50
	C871, 872	AUDIO FILM CAPACITOR	CFTXA222J50
	C873, 874		CFTXA471J50
	C875, 876	AUDIO FILM CAPACITOR	CFTXA182J50
	C877, 878	AUDIO FILM CAPACITOR	CFTXA393J50
	C879-882	AUDIO FILM CAPACITOR	CFTXA182J50
	C883, 884	AUDIO FILM CAPACITOR	CFTXA104J50
	C885, 886	ELECT. CAPACITOR	CEASR47M50
	C887, 888	AUDIO FILM CAPACITOR	CFTXA223J50
	C889, 890	AUDIO FILM CAPACITOR	CFTXA104J50
	C891, 892	AUDIO FILM CAPACITOR	CFTXA183J50
	C893, 894	AUDIO FILM CAPACITOR	CFTXA104J50
	C895, 896	AUDIO FILM CAPACITOR	CFTXA182J50
	C897-900	ELECTR. CAPACITOR	CEYA100M50
	C901-904	ELECTR. CAPACITOR	CEYA010M50

RESISTORS

	R803-808	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R811-870	CARBONFILM RESISTOR	RD1/6PM□□□J
	R871-884	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R885-900	CARBONFILM RESISTOR	RD1/6PM□□□J
	R901-904	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R905-910	CARBONFILM RESISTOR	RD1/6PM□□□J
	VR801, 802	VARIABLE RESISTOR	RCP1091

DECODE UNIT

SEMICONDUCTORS

	IC1101, 1102		CXA1417S
	IC1103-1105	OP AMP	M5238PF

CAPACITORS

	C1109, 1110	ELECT. CAPACITOR	CENA220M50
	C1111, 1112	AUDIO FILM CAPACITOR	CFTXA104J50
	C1113, 1114	ELECT. CAPACITOR	CENA100M50
	C1115, 1116	ELECT. CAPACITOR	CEASR22M50
	C1117, 1118	AUDIO FILM CAPACITOR	CFTXA183J50
	C1119, 1120	AUDIO FILM CAPACITOR	CFTXA223J50
	C1121, 1122	AUDIO FILM CAPACITOR	CFTXA104J50
	C1123, 1124	ELECT. CAPACITOR	CEASR22M50
	C1125, 1126	AUDIO FILM CAPACITOR	CFTXA105J50
	C1127, 1128		CFTXA681J50
	C1129, 1130	AUDIO FILM CAPACITOR	CFTXA393J50
	C1131, 1132		CFTXA102J50
	C1133, 1134	AUDIO FILM CAPACITOR	CFTXA822J50
	C1135, 1136	AUDIO FILM CAPACITOR	CFTXA224J50
	C1137, 1138	AUDIO FILM CAPACITOR	CFTXA823J50
	C1139, 1140	AUDIO FILM CAPACITOR	CFTXA153J50
	C1141, 1142	ELECT. CAPACITOR	CEASR10M50
	C1143, 1144	AUDIO FILM CAPACITOR	CFTXA474J50
	C1145, 1146	ELECT. CAPACITOR	CEASR22M50
	C1147, 1148	ELECT. CAPACITOR	CEASR10M50
	C1149-1152	ELECTR. CAPACITOR	RCH1057
	C1153, 1154	AUDIO FILM CAPADITOR	CFTXA334J50
	C1155, 1156	AUDIO FILM CAPACITOR	CFTXA823J50
	C1157, 1158	AUDIO FILM CAPACITOR	CFTXA474J50
	C1159, 1160	AUDIO FILM CAPACITOR	CFTXA104J50
	C1161, 1162	AUDIO FILM CAPACITOR	CFTXA224J50
	C1163, 1164	AUDIO FILM CAPACITOR	CFTXA473J50
	C1165, 1166	AUDIO FILM CAPACITOR	CFTXA153J50

Mark	No.	Description	Part No.
	C1167, 1168	AUDIO FILM CAPACITOR	CFTXA822J50
	C1169, 1170		CFTXA102J50
	C1171, 1172	AUDIO FILM CAPACITOR	CFTXA222J50
	C1173, 1174		CFTXA471J50
	C1175, 1176	AUDIO FILM CAPACITOR	CFTXA182J50
	C1177, 1178	AUDIO FILM CAPACITOR	CFTXA393J50
	C1179-1182	AUDIO FILM CAPACITOR	CFTXA182J50
	C1183, 1184	AUDIO FILM CAPACITOR	CFTXA104J50
	C1185, 1186	ELECT. CAPACITOR	CEASR47M50
	C1187, 1188	AUDIO FILM CAPACITOR	CFTXA223J50
	C1189, 1190	AUDIO FILM CAPACITOR	CFTXA104J50
	C1191, 1192	AUDIO FILM CAPACITOR	CFTXA183J50
	C1193, 1194	AUDIO FILM CAPACITOR	CFTXA104J50
	C1195, 1196	AUDIO FILM CAPACITOR	CFTXA182J50
	C1197-1200	ELECTR. CAPACITOR	CEYA100M50
	C1201-1204	ELECTR. CAPACITOR	CEYA010M50
	C1205, 1206		CFTXA102J50
RESISTORS			
	R1105-1108	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R1111-1170	CARBONFILM RESISTOR	RD1/6PM□□□J
	R1171-1184	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R1185-1200	CARBONFILM RESISTOR	RD1/6PM□□□J
	R1201-1210	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R1211, 1212	CARBONFILM RESISTOR	RD1/6PM□□□J
	R1213-1216	CARBONFILM RESISTOR	RDR1/4PM□□□J
	R1217-1220	CARBONFILM RESISTOR	RD1/6PM□□□J
	VR1101, 1102	VARIABLE RESISTOR	RCP1092

VR UNIT

RESISTORS

	VR972	VARIABLE RESISTOR (20 kΩ)	RCV1085

BAL.VR UNIT

RESISTORS

	VR973	VARIABLE RESISTOR (200 kΩ)	RCV1078

HEADPHONE UNIT

SEMICONDUCTORS

	IC231	OP-AMP, IC	M5218AP
	Q231, 232	TRANSISTOR	2SD2144S

CAPACITORS

	C231, 232	ELECTR. CAPACITOR	CEYA010M50
	C233, 234	ELECTR. CAPACITOR	PCH1076
	C235, 236	AXIAL CAPACITOR	CKPUYB221K50

RESISTORS

	R231-236	CARBONFILM RESISTOR	RD1/6PM□□□J
	R237, 238	CARBONFILM RESISTOR	RD1/4PM□□□J
	R239-242	CARBONFILM RESISTOR	RD1/6PM□□□J
	VR231	VARIABLE RESISTOR	PCS1002

OTHERS

	JA231	JACK	RKN1002

Mark	No.	Description	Part No.

REC SWITCH UNIT

SWITCHES

	S3	SWITCH	RSG-143

TAPE SELECTOR UNIT

SWITCHES

	S1, 2	SLIDE SW	RSH-070

CONNECTOR UNIT

CAPACITORS

	C1	CERAMIC CAPACITOR	CKCYF473Z50

RESISTORS

	R4, 5	CARBONFILM RESISTOR	RD1/6PM□□□J

SENSOR UNIT (B)

SEMICONDUCTORS

	D2	PHOTO-INTERRUPTER	GP1A51HR

CAPACITORS

	C3	AXIAL CERAMIC CAPACITOR	CKPUYY103N16

RESISTORRS

	R3	CARBONFILM RESISTOR	RD1/6PM□□□J

CONTROL UNIT

SEMICONDUCTORS

	IC651	MAIN CPU	PD4359A
	IC652	EEPROM	M6M80011AL
	IC661	CMOS LOGIC IC	TC4050BP
	IC671	IC	BA6109
	IC681	IC	BA6109
	IC703	COMPARATOR	BA10393N
	IC713	CMOS LOGIC IC	TC4050BP
	Q655, 656	DIGITAL TRANSISTOR	DTA114TS
	Q665	TRANSISTOR	DTC114ES
	Q667	TRANSISTOR	DTC124ES
	Q668	DIGITAL TRANSISTOR	DTC114TS
	Q672-674	TRANSISTOR	DTC114ES
	Q681-683	TRANSISTOR	2SA1309A
	Q687	TRANSISTOR	2SA1309A
	Q688	TRANSISTOR	DTC114ES
	Q705	DIGITAL TRANSISTOR	DTA114ES
	Q706	TRANSISTOR	2SC3311A
	Q707, 708	DIGITAL TRANSISTOR	DTC114TS
	Q709	DIGITAL TRANSISTOR	DTA114ES
	Q710	DIGITAL TRANSISTOR	DTC114TS
	Q715	TRANSISTOR	DTC114ES
	D652, 653	DIODE	1SS254
⚠	D681	RECRIFIER DIODE	1SR35-100A

COILS/TRANSFORMERS

	L671		RTF1068

CAPACITORS

	C651	CERAMIC CAPACITOR	CKCYF103Z50
	C652	ELECT. CAPACITOR	CEAS101M10
	C653	ELECT. CAPACITOR	CEAS102M6R3

Mark	No.	Description	Part No.
	C654	CERAMIC CAPACITOR	CKCYF473Z50
	C657, 658	AXIAL CAPACITOR	CKPUYB101K50
	C661	CERAMIC CAPACITOR	CKCYF103Z50
	C662	ELECT. CAPACITOR	CEAS100M50
	C666	ELECT. CAPACITOR	CEAS330M16
	C671	CERAMIC CAPACITOR	CKCYF103Z50
	C672	CERAMIC CAPACITOR	CKCYF473Z50
	C681	ELECT. CAPACITOR	CEANP4R7M25
	C682	ELECT. CAPACITOR	CEASR22M50
	C683	CERAMIC CAPACITOR	CKCYF103Z50
	C684	ELECT. CAPACITOR	CEAS330M16
	C685	ELECT. CAPACITOR	CEAS101M16
	C691	ELECT. CAPACITOR	CEAS100M50
	C703	CERAMIC CAPACITOR	CKCYF473Z50
	C713	ELECT. CAPACITOR	CEAS100M50
	C714-717	CERAMIC CAPACITOR	CKCYF103Z50
RESISTORS			
	R651-658	CARBONFILM RESISTOR	RD1/6PM□□□J
	R663	LADDER RESISTOR (10k)	RCX1042
	R665-668	CARBONFILM RESISTOR	RD1/6PM□□□J
	R671-675	CARBONFILM RESISTOR	RD1/6PM□□□J
	R681	METAL OXIDE RESISTOR	RS1LMF□□□J
	R683-688	CARBONFILM RESISTOR	RD1/6PM□□□J
	R691-700	CARBONFILM RESISTOR	RD1/6PM□□□J
	R702-704	CARBONFILM RESISTOR	RD1/6PM□□□J
	R705, 706	METALFILM RESISTOR	RN1/6PQ□□□□F
	R707	CARBONFILM RESISTOR	RD1/6PM□□□J
	R709-712	METALFILM RESISTOR	RN1/6PQ□□□□F
	R713	LADDER RESISTOR (10k)	RCX1042
	R714, 715	CARBONFILM RESISTOR	RD1/6PM□□□J
OTHERS			
	CN200	CONNECTOR(13P)	TXC-P13X-A1
	CN210	CONNECTOR(13P)	TXC-P13X-A1
	JA71	JACK	RKN1014
	JA72, 73	JACK	RKN1004
	X651	CERAMIC RESONATOR	VSS1014

FL UNIT

Mark	No.	Description	Part No.
SEMICONDUCTORS			
	IC721	SUB CPU	PD3198A
	D724-727	DIODE	1SS254
	D729	DIODE	1SS254
	D735-737	DIODE	1SS254
	D750	DIODE	1SS254
	D752	DIODE	1SS254
SWITCHES			
	S721-729	SWITCH	RSG1030
	S735	SLIDE SWITCH	RSH1011
CAPACITORS			
	C721	CERAMIC CAPACITOR	CKCYF103Z50
	C722	ELECT. CAPACITOR	CEAS100M50
	C723	CERAMIC CAPACITOR	CKCYF103Z50
RESISTORS			
	R721-727	CARBONFILM RESISTOR	RD1/6PM□□□J
	R729-732	CARBONFILM RESISTOR	RD1/6PM□□□J
	R735, 736	CARBONFILM RESISTOR	RD1/6PM□□□J
	R741-764	CARBONFILM RESISTOR	RD1/6PM□□□J
OTHERS			
	V721	FL TUBE	RAW1096
	X721	CERAMIC RESONATOR	VSS1014

OPERATION UNIT

Mark	No.	Description	Part No.
SEMICONDUCTORS			
	IC781	LOGIC IC	BU2040
	D781	LED	SEL6410G
	D782	LED	SEL6C10R
	D783	LED	SEL6910D
	D784	LED	SEL6C10R
	D786	LED	SEL3910ALC05
	D788, 789	LED	SEL3910ALC05
SWITCHES			
	S781-793	SWITCH	RSG1030
CAPACITORS			
	C781	CERAMIC CAPACITOR	CKCYF103Z50
	C782	ELECT. CAPACITOR	CEJA100M16
	C791, 792	AXIAL CAPACITOR	CKPUYB101K50
RESISTORS			
	R781-784	CARBONFILM RESISTOR	RD1/6PM□□□J
	R786	CARBONFILM RESISTOR	RD1/6PM□□□J
	R788, 789	CARBONFILM RESISTOR	RD1/6PM□□□J
	R791, 792	CARBONFILM RESISTOR	RD1/6PM□□□J

BIAS UNIT

Mark	No.	Description	Part No.
SEMICONDUCTORS			
	IC521	DOLBY HX PRO IC	UPC1297CA
⚠	IC606	REGULATOR IC	NJM7812FA
⚠	IC607	REGULATOR IC	NJM7805FA
	Q504	TRANSISTOR	2SA1283
	Q505, 506	TRANSISTOR	2SC3243
	Q507	TRANSISTOR	2SC3311A
	Q508	TRANSISTOR	DTC124ES
	Q509	TRANSISTOR	2SC3311A
	Q510	TRANSISTOR	DTC124ES
	Q511	TRANSISTOR	DTC114ES
	Q512	DIGITAL TRANSISTOR	DTA114ES
	Q513	TRANSISTOR	2SA1309A
	Q543-546	TRANSISTOR	DTC114ES
	Q614	TRANSISTOR	2SA1309A
⚠	Q623	TRANSISTOR	2SA1283
	D501, 502	DIODE	1SS254
⚠	D601	BRIDGE STACK	S2VB20
⚠	D604	RECRIFIER DIODE	1SR35-100A
	D611-613	DIODE	1SS254
⚠	D621	RECRIFIER DIODE	1SR35-100A
	D622	ZENER DIODE	MTZJ6.8B
⚠	D623	ZENER DIODE	MTZJ24D
SWITCHES			
⚠	S641	SWITCH	RSA1001

Mark	No.	Description	Part No.
COILS/TRANSFORMERS			
	L501	RADIAL INDUCTOR	LFA121K
	L502	COIL	RTD1057
	L521, 522	COIL	RTD1011
CAPACITORS			
	C501	CERAMIC CAPACITOR	CKCYF473Z50
	C502	ELECT. CAPACITOR	CEAS101M16
	C503	ELECT. CAPACITOR	CEAS100M50
	C504, 505	ELECT. CAPACITOR	CEAS330M16
	C507, 508	AUDIO FILM CAPACITOR	CFTXA332J50
	C509	AUDIO FILM CAPACITOR	CFTXA223J50
	C510	AUDIO FILM CAPACITOR	CFTXA682J50
	C511	CAPACITOR	CQPA752J100
	C515	ELECT. CAPACITOR	CEAS220M25
	C516	ELECT. CAPACITOR	CEAS100M50
	C517	ELECT. CAPACITOR	CEAS4R7M50
	C521	CERAMIC CAPACITOR	CCCCH470J50
	C523, 524	CERAMIC CAPACITOR	CKCYF473Z50
	C525, 526	CERAMIC CAPACITOR	RCG1004
	C527, 528	CERAMIC CAPACITOR	CCCSL101K500
	C529-532	CERAMIC CAPACITOR	CGCYX223K25
	C533, 534	AXIAL CAPACITOR	CKPUYB821K50
	C535, 536	CERAMIC CAPACITOR	CGCYX103K25
	C537	ELECT. CAPACITOR	CEAS330M16
	C539, 540	CERAMIC CAPACITOR	CKCYF103Z50
	C601-603	CERAMIC CAPACITOR	CKCYF473Z50
	C605	ELECTR. CAPACITOR	RCH1032
	C607	ELECT. CAPACITOR	CEAS682M16
	C608	ELECT. CAPACITOR	CEAS102M6R3
	C611	ELECT. CAPACITOR	CEAS4R7M50
	C614	CERAMIC CAPACITOR	CKCYF103Z50
	C621	CERAMIC CAPACITOR	CKCYF473Z50
	C622	ELECT. CAPACITOR	CEAS101M50
	C623	CERAMIC CAPACITOR	CKCYF473Z50
	C624	ELECT. CAPACITOR	CEAS101M25
	C625	CERAMIC CAPACITOR	CKCYF473Z50
	C626	ELECT. CAPACITOR	CEAS101M16
	C627, 628	CERAMIC CAPACITOR	CKCYF473Z50
⚠	C641	CAPACITOR (CERAMIC)	VCG-044
RESISTORS			
	R505-508	CARBONFILM RESISTOR	RD1/6PM□□□J
	R509, 510	CARBONFILM RESISTOR	RD1/2PMF□□□J
	R511	CARBONFILM RESISTOR	RD1/2LF□□□J
	R512-514	CARBONFILM RESISTOR	RD1/6PM□□□J
	R515, 516	METALFILM RESISTOR	RN1/6PQ□□□□F
	R517-519	CARBONFILM RESISTOR	RD1/6PM□□□J
	R523-525	CARBONFILM RESISTOR	RD1/6PM□□□J
	R531	CARBONFILM RESISTOR	RD1/6PM□□□J
	R533-536	CARBONFILM RESISTOR	RD1/6PM□□□J
	R539-542	CARBONFILM RESISTOR	RD1/6PM□□□J
	R611-613	CARBONFILM RESISTOR	RD1/6PM□□□J
⚠	R621	FUSLIBLE RESISTOR	RFA1/4L□□□J
	R622	CARBONFILM RESISTOR	RD1/2PMF□□□J
	R623	METAL OXIDE RESISTOR	RS1LMF□□□J
	VR545, 546	VR	RCP1090

Mark	No.	Description	Part No.
OTHERS			
⚠		TERMINAL	RKC-061

7. ADJUSTMENTS

7.1 MECHANICAL ADJUSTMENT

1. Tape speed Adjustment			
Mode	Test tape	Adjustment position	Specification rating (playback frequency)
PLAY	Play the STD-301 tape (3kHz)	Tape speed adjustment hole	3015Hz ± 5Hz

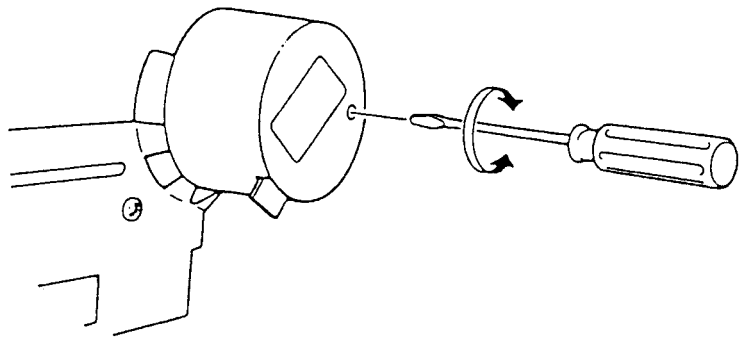


Fig. 7–1 Tape speed adjustment

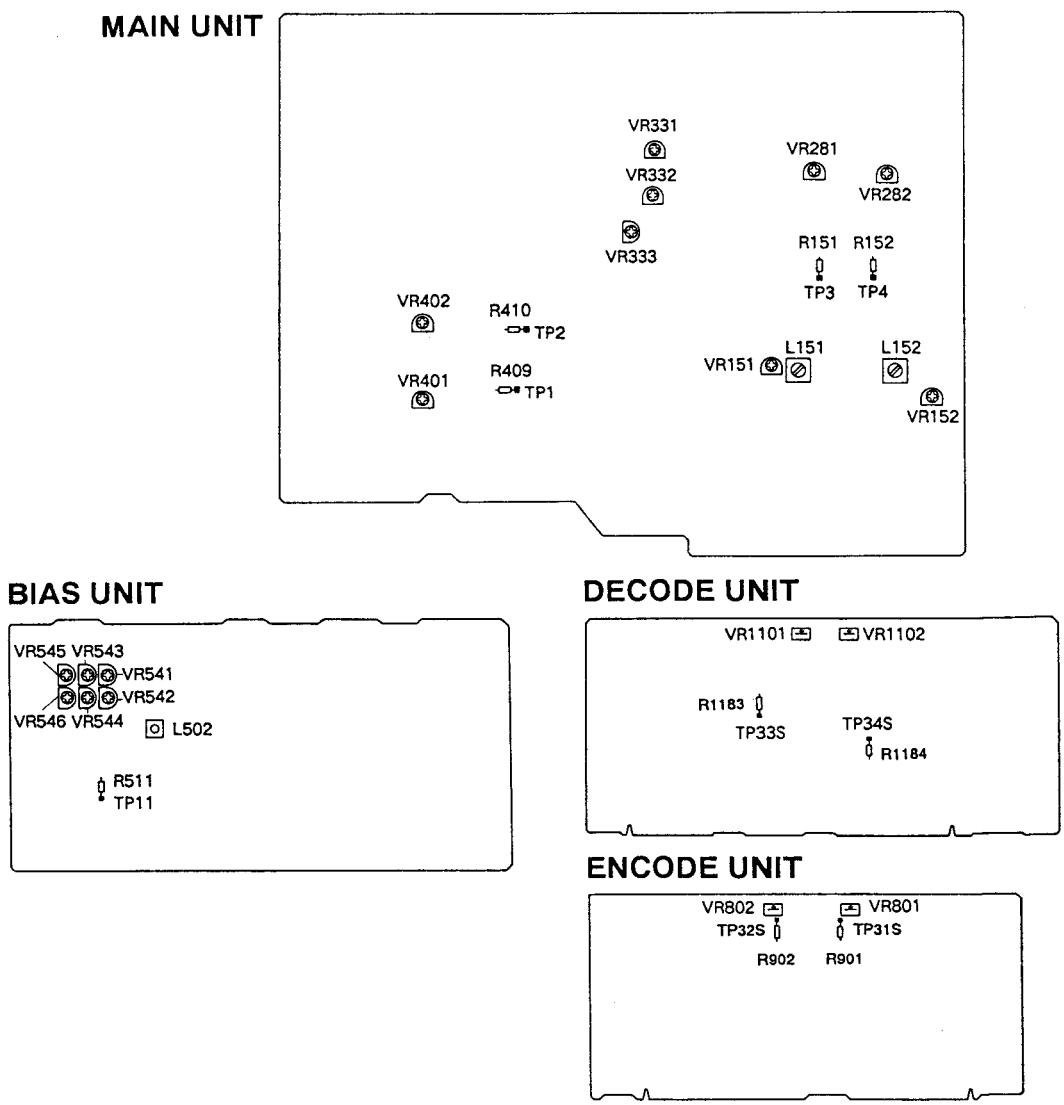


Fig. 7–2 Adjusting points

7.2 ELECTRICAL ADJUSTMENTS

Adjustment Conditions

1. The mechanical adjustments must be completed first.
2. The head must be cleaned and demagnetized.
3. Turn power on allow the deck to warm up for at least a few minutes before commencing any electrical adjustments.
4. The reference signal is 0 dBV=1 Vrms.
5. Connect a 50 kΩ (or between 47k to 52 kΩ) load resistance to the OUTPUT terminals.
6. Unless otherwise specified, the switches listed below are left in the positions indicated.
   DOLBY NR : OFF
   TAPE SELECTOR : NORM

Test Tapes

STD–331E : Playback adjustments (See Fig. 7–3)
STD–631 : NORMAL blank tape
STD–621 : CrO_2 blank tape
STD–610 : METAL blank tape

* As the reference recording level is 250 nwb/m for STD–331E, the recording level will be higher by 4 dB for STD–331B (160 nwb/m). When adjusting, pay carefull attention to the type of tape used.

List of Adjustments

Playback sections

1. Head azimuth adjustment.
2. Playback level adjustment.

Recording sections

1. Bias oscillator adjustment.
2. Bias trap adjustment.
3. DOLBY-S encoder adjustment.
4. Recording bias adjustment.
5. Recording level adjustment.
6. Level meter check.
7. AUTO BLE adjustment.

NOTE: This unit has an automatic tape selection feature.

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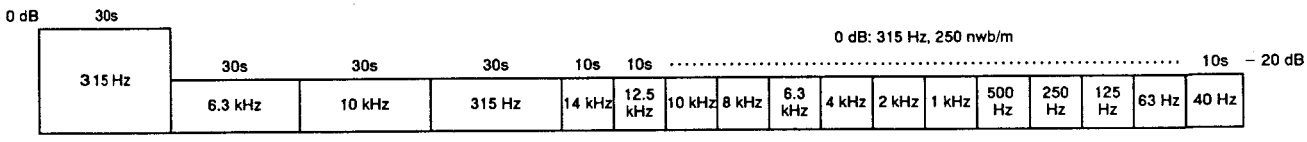


Fig. 7–3 Constants of the test tape STD–331E

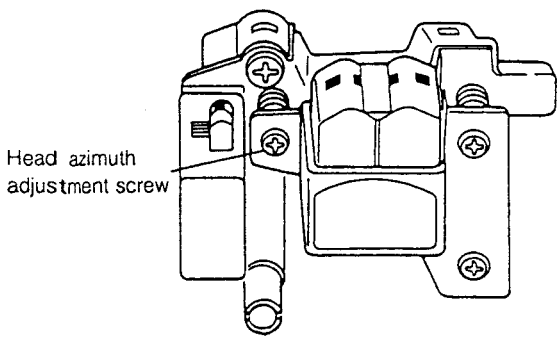


Fig. 7–4 Head azimuth adjustment

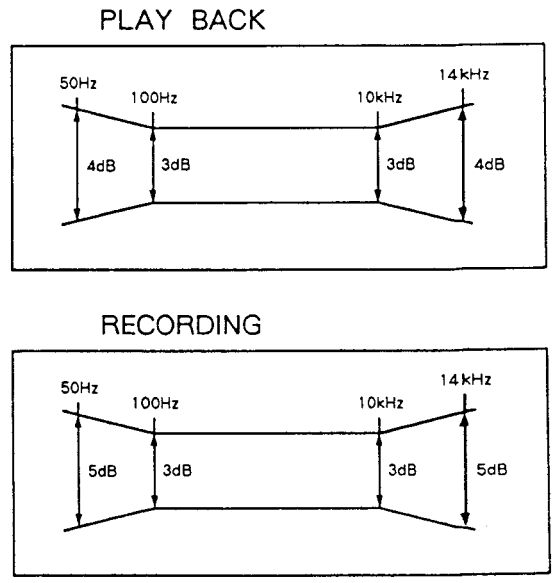


Fig. 7–5 Frequency response zone

PLAYBACK SECTION

1. Head Azimuth Adjustment

- Turn VR151, 152 to mechanical center positions.

No.	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1.	PLAY	Play the 10 kHz/–20 dB section of STD–331E test tape.	Head azimuth adjustment screw. (See Fig. 7–4)	LINE OUT	Maximum playback signal level.	
2.	STOP	Lock the screw with screw lock after completing adjustment.				

Note: The left and right phase difference for the 12.5 kHz tone should be within 75 degrees. (That for the 10 kHz tone should be within 60 degrees.)

2. Playback Level Adjustment

- This adjustment determines the DOLBY NR level, and must be performed with great care.

No.	Mode	Input signal & test tape	Adjustment location		Measuring location	Adjustment value	Remarks
1.	PLAY	Play the 315 Hz/0 dB section of the STD–331E test tape.	Deck	VR151 (Lch) VR152 (Rch)	TP. 3 (Lch) TP. 4 (Rch)	–11.0 dBV	
2.	Set the DOLBY NR switch to the S position.						
3.	PLAY	Play the 315 Hz/0 dB section of the STD–331E test tape.	DOLBY S	VR1101 (Lch) VR1102 (Rch)	TP. 33S (Lch) TP. 34S (Rch)	–6.5 dBV	

RECORDING SECTION

1. Bias Oscillator Adjustment

No.	Mode	Input signal & test tape	Adjustment location		Measuring location	Adjustment value	Remarks
1.	REC/ PLAY	Load the STD–610 test tape with no input signal.	Deck	L502	TP. 11	106 kHz ± 300 Hz	

2. Bias Trap Adjustment

No.	Mode	Input signal & test tape	Adjustment location		Measuring location	Adjustment value	Remarks
1.	REC/ PLAY	Load the STD–610 test tape with no input signal.	Deck	L151 (Lch) L152 (Rch)	TP. 3 (Lch) TP. 4 (Rch)	Minimum output	

3. DOLBY-S Encoder Adjustment

No.	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1.	Set the DOLBY NR switch to the OFF position.					
2.	REC/ PAUSE	Apply a 315 Hz/–10 dBV signal to the line input terminals.	REC level control volume	TP. 1 (Lch) TP. 2 (Rch)	–15.2 dBV	
3.	Set the DOLBY NR Switch to the S position.					
4.	REC/ PAUSE	Apply a 315 Hz/–10 dBV signal to the line input terminals.	VR801 (Lch) VR802 (Rch)	TP. 1 (Lch) TP. 2 (Rch)	–14.5 dBV	

4.Recording Bias Adjustment

- After the adjustment, Caution should be exercised so as not to become under bias by checking the distortion rate.
- Set the DOLBY NR switch to the OFF position.

No.	Mode	Input signal & test tape	Adjustment location		Measuring location	Adjustment value	Remarks
1.	REC/ PLAY	Record the 315 Hz and 10kHz signals at − 26 dBV input level onto the STD − 631 test tape, and Playback.	NOR.	VR541 (Lch) VR542 (Rch)	LINE OUT	Repeatedly record, playback and adjust so that the playback level of 10 kHz signal becomes 0 dB ± 0.5dB when compared with the 315Hz signal.	
2.		Record the above signal onto the STD−621 test tape, and playback.	CrO2	VR543 (Lch) VR544 (Rch)		0 dB ± 0.5 dB	
3.		Record the above signal onto the STD−610 test tape, and playback.	MET.	VR545 (Lch) VR546 (Rch)		0 dB ± 0.5 dB	
4.	Set the DOLBY NR switch to the S position.						
5.		Record the 315 Hz and 10kHz signals at − 26 dBV input level onto the STD − 631 test tape, and Playback.	NOR.	VR541 (Lch) VR542 (Rch)	LINE OUT	Repeatedly record, playback and adjust so that the playback level of 10 kHz signal becomes 0 dB ± 1.0dB when compared with the 315Hz signal.	
6.		Record the above signal onto the STD−621 test tape, and playback.	CrO2	VR543 (Lch) VR544 (Rch)		0 dB ± 1.0 dB	
7.		Record the above signal onto the STD−610 test tape, and playback.	MET.	VR545 (Lch) VR546 (Rch)		0 dB ± 1.0 dB	

5. Recording Level Adjustment

- Set the DOLBY NR switch to the OFF position.

No.	Mode	Input signal & test tape	Adjustment location		Measuring location	Adjustment value	Remarks
1.	REC PAUSE	Apply a 315 Hz/ − 4 dBV signal to the line input terminals, load the STD−631 test tape.	REC level control volume		TP. 3 (Lch) TP. 4 (Rch)	−15.2 dBV	
2.	REC/ PLAY	Record the above signal onto the STD − 631 test tape, and playback.	Deck	VR401 (Lch) VR402 (Rch)	TP. 3 (Lch) TP. 4 (Rch)	Repeatedly record, playback and adjust so that the playback signal level becomes −15.2 dB.	
3.	REC/ PLAY	Record the above signal onto the STD − 621 test tape, and playback.	Check			−15.2 dBV ± 1 dB	
4.	REC/ PLAY	Record the above signal onto the STD − 610 test tape, and playback.	Check			−15.2 dBV ± 1 dB	
5.	STOP	Set the DOLBY NR switch to the S position.					
6.	REC/ PLAY	Record the above signal onto the STD − 631 test tape, and playback.	Check		LINE OUT	0 dB ± 0.5 dB for paragraph 2.(* 1)	

* 1: If this confirmation value cannot be obtained, perform "Playback Level Adjustment" and "DOLBY − S Encoder Adjustment" once again.

6. Level Meter Adjustment

No.	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1.	REC PAUSE	Apply a 315 Hz/−6 dBV (501 mV) signal to the line input terminals.	VR281 (Lch) VR282 (Rch)	TP. 1 (Lch) TP. 2 (Rch)	Adjust that the level meters " 0 dB " light up within − 11.2 dBV ± 0.5 dB of the signal output level.	

Note: Rotate from the left to the right, and adjust so that it lights up. Be sure to adjust properly as it will serve as the reference level for BLE.

7. AUTO BLE Adjustment

- BLE Adjustment must be performed after all other adjustments are completed.
- This adjustment should be performed in the test mode.
- Entering the test mode
  Press the COUNTER, METER and MONITOR (AUTO) keys on the front panel simultaneously, with the power ON. The unit enters the test mode and oscillates a 400 Hz signal.
  Thereafter, each time the START/CLEAR key is pressed, the oscillation frequency changes as follows: 3 kHz oscillation → 15 kHz oscillation → 400Hz oscillation

No.	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1.	–	REC LEVEL VR MIN or no signal input.	–	–	–	
2.		Press the three keys COUNTER, METER and MONITOR (AUTO) on the front panel simultaneously.	VR331	Level meter Rch	Adjust so that 0 dB on the level meter lights.	400 Hz adjustment
3.		Press the START/CLEAR key once.	VR332		Adjust so that 0 dB on the level meter lights.	3 kHz adjustment
4.		Press the START/CLEAR key once.	VR333		Adjust so that –3 dB on the level meter lights.	15 kHz adjustment
5.	When the RESET (COUNTER) key is pressed again, the test mode is released.					

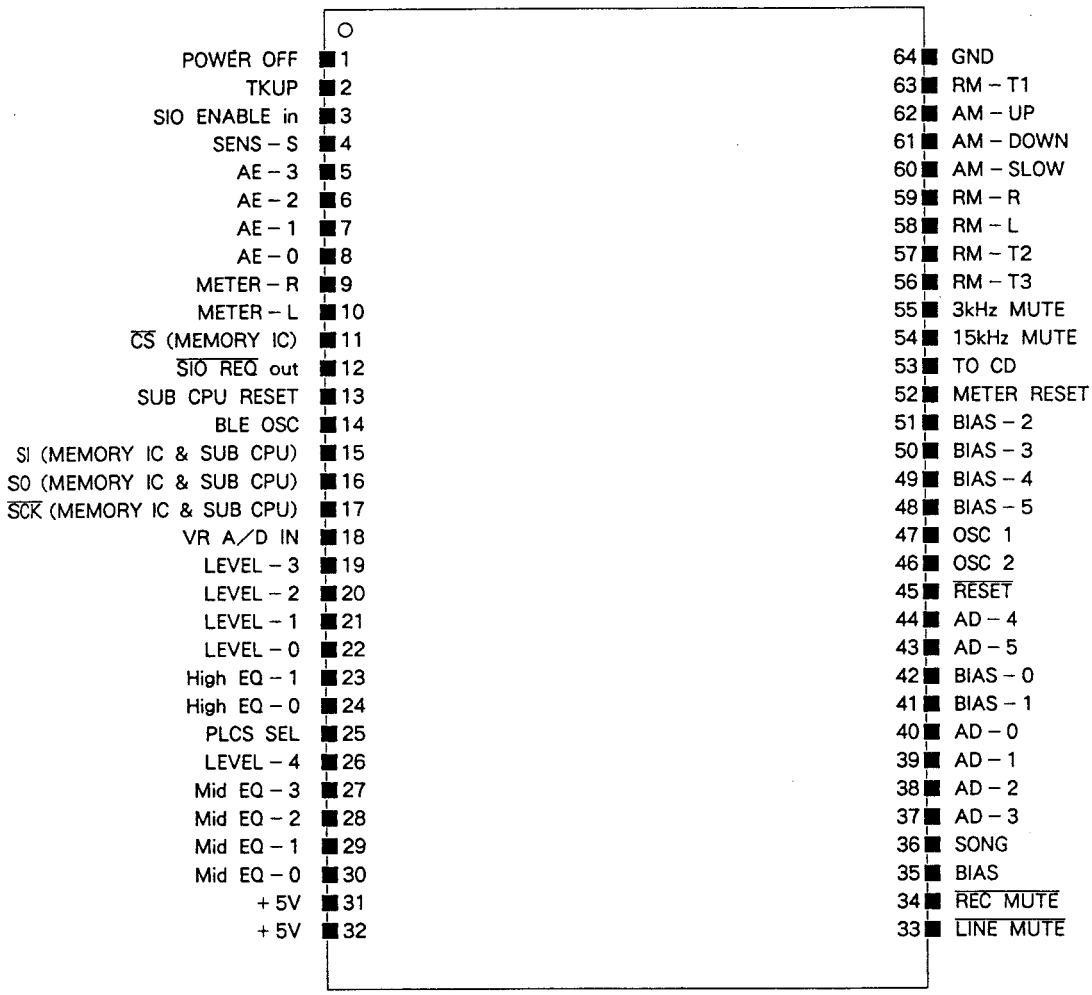
8. IC INFORMATION

• The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

8.1 PD4359A (IC651)

• MAIN CPU (BLE AND MAIN CONTROLS)

PORT ARRANGEMENT



INPUT/OUTPUT MATRIX TABLE

Tape Type Detection Input

	CrO2 (in) (SUB CPU)	NORMAL (in) (SUB CPU)	High EQ – 1 (out) (MAIN CPU)	High EQ – 0 (out) (MAIN CPU)
TAPE : NORMAL	L	H	0	1
TAPE : CrO2	H	L	0	1
TAPE : METAL	L	L	1	0

• Standard setting output values

LEVEL (5bit) : 01111
Mid EQ (4bit) : 0111
High EQ (2bit) : According to above table.

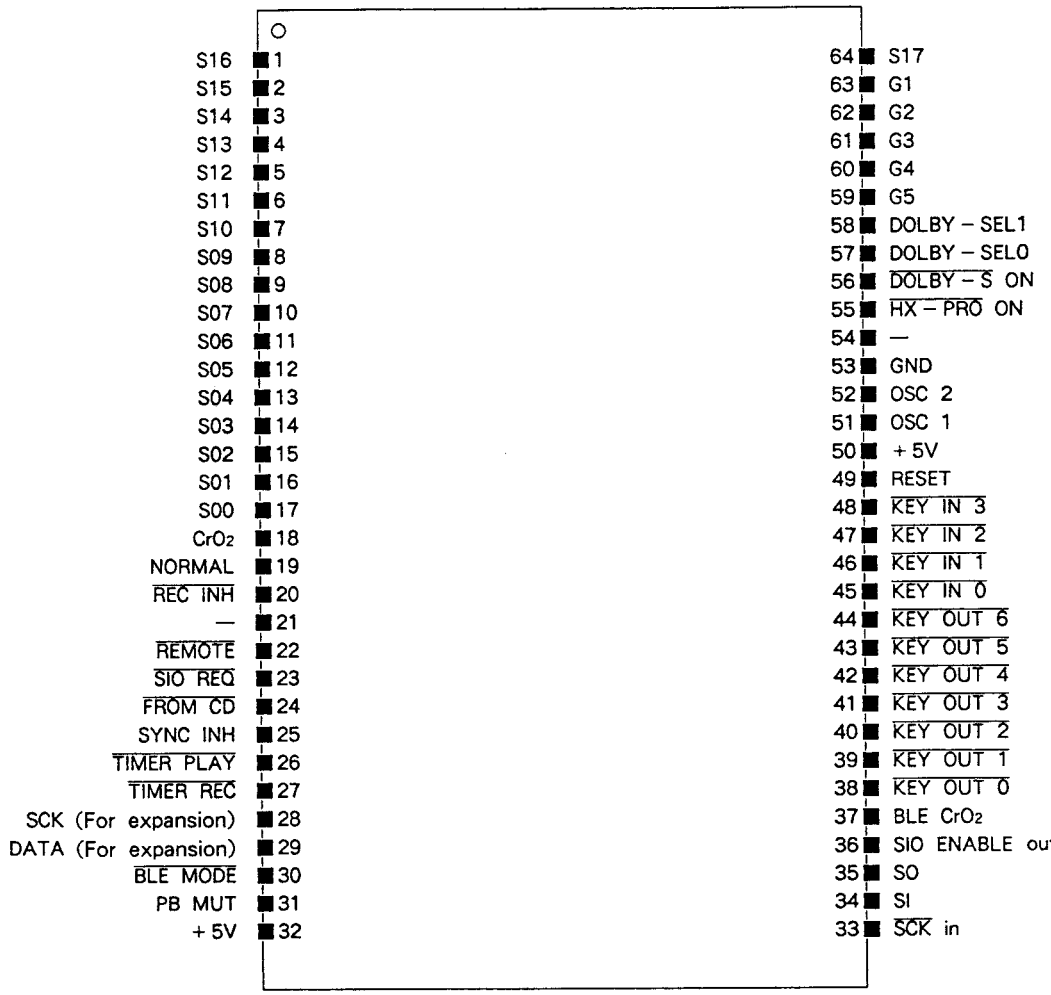
PIN DESCRIPTIONS

Pin No.	Name	Function
1	POWER OFF	Interrupting pin which detects that the power supply switch has been turned off at level "H".
2	TKUP	———
3	SIO ENABLE	Input pin of the communication permission signal from the sub CPU. Outputs level "L" to the SIO REQ pin (Pin 12) when communication starts. Communication starts when this pin becomes level "H".
4	SENSING	Sensing pulse input pin of the reel table on the supply side of the mechanism (REW side). Used for the ATLC function, tape remaining display, tape – end detection.
5	AE – 3	Pins which inputs the encoder position during mechanism assist.
6	AE – 2	
7	AE – 1	
8	AE – 0	
9	METER – R	LEVEL SCAN input pins.
10	METER – L	
11	$\overline{CS}$	Outputs level "L" during communication with the external memory IC (IC652).
12	$\overline{SIO\ REQ}$	Output pin of the communication request to the sub CPU. Outputs level "L" during communication.
13	SUB CPU RESET	Outputs level "H" during power on, power off and communication error, and resets the sub CPU.
14	BLE OSC	Outputs the 400/3K/12kHz square waveform during AUTO BLE.
15	SI	Input pin of the communication data from the sub CPU and external memory.
16	SO	Output pin of the communication data to the sub CPU and external memory.
17	$\overline{SCK}$	Output pin of the communication timing (CLOCK) with the sub CPU and external memory.
18	VR A/D IN	Recording VR position SCAN input pin during PLCS.
19	LEVEL – 3	Recording level correction data output pins of the FLAT function.
20	LEVEL – 2	
21	LEVEL – 1	
22	LEVEL – 0	
23	High EQ – 1	High band correction data output pin of the recording equalizer.
24	Hifh EQ – 0	
25	PLCS SEL	Outputs level "H", and switches the level detection circuit to "recording VR position detection" during PLCS.
26	LEVEL – 4	Recording level correction data output pins of the FLAT function.
27	Mid EQ – 3	Recording equalizer correction data output pin of the FLAT function.
28	Mid EQ – 2	
29	Mid EQ – 1	
30	Mid EQ – 0	
31	–	Connected to VDD.
32	Vdd	Connected to VDD.

Pin No.	Name	Function
33	$\overline{\text{LINE MUTE}}$	Outputs level "L" and mutes line output. When monitor mode is "SOURCE", outputs level "H" and releases mute. When "TAPE", releases mute only during PLAY and REC.
34	$\overline{\text{REC MUTE}}$	Outputs level "L" and mutes the recording amplifier output. Imposes mute constantly except during REC.
35	BIAS	Outputs level "H" and outputs the bias current and erase current.
36	SONG	Input pin of the signal detecting intervals between songs during MS. Determines as "in the middle of a song" at "H".
37	AD – 3	SCAN data output pins for LEVEL SCAN and recording VR position detection.
38	AD – 2	
39	AD – 1	
40	AD – 0	
41	BIAS – 1	Bias amount control data output pins. Bias correction of FLAT function. Changes the data with manual operations using the BIAS, "+", and " – – " keys and controls the bias amount.
42	BIAS – 0	
43	AD – 3	Scan data output pins for LEVEL SCAN and recording VR position detection.
44	AS – 2	
45	$\overline{\text{RESET}}$	Microprocessor is reset with the input of the level "L" pulse wave during power on and off.
46	OSC2	Microprocessor clock input pins. Connects the 4.19 MHz ceramics filter oscillator.
47	OSC1	
48	BIAS – 5	Bias amount control data output pins. Bias correction of the FLAT function. Changes the data with manual operations using the BIAS, "+", and " – "keys and controls the bias amount.
49	BIAS – 4	
50	BIAS – 3	
51	BIAS – 2	
52	METER RESET	Output pins which output level "H" and shortens the recovery time of the meter circuit. Used when reading the level with FLAT and PLCS functions. When LINE MUTE has been set, outputs level "H" and ensures that the meter does not swing.
53	TO CD	Data output pin for CD synchronization.
54	15kHz MUTE	OSC output control pins of the FLAT function.
55	3kHz MUTE	
56	RM – T3	Reel motor torque control pins of the digital tension control function.
57	RM – T2	
58	RM – L	Outputs level "L", and rotates the reel motor of the mechanism in the clockwise direction (FF direction).
59	RM – R	Outputs level "L", and rotates the reel motor of the mechanism in the counterclockwise direction (REW direction).
60	AM – SLOW	During mechanism assist, outputs level "H" or "L" and controls the assist motor. Outputs level "H" when the assist motor stops.
61	AM – DOWN	
62	AM – UP	
63	RM – T1	Reel motor torque control pin of the digital tension control function.
64	Vss	Connected to GND.

8.2 PD3198A (IC721)
• SUB CPU (DISPLAY AND KEY INPUT)

PORT ARRANGEMENT



SUB CPU INPUT MATRIX TABLE (All "L" Active)

	$\overline{KI3}$	$\overline{KI2}$	$\overline{KI1}$	$\overline{KI0}$	
$\overline{KO0}$	MONITOR XCH	HX – PRO ON/OFF	DOLBY	LINE STRAIGHT	
$\overline{KO1}$	OPEN/CLOSE	REC	PAUSE	MUTE	
$\overline{KO2}$	STOP	REW	PLAY	FF	
$\overline{KO3}$	CD SYNCHRO	BIAS UP	BIAS DOWN	FLAT START/CLEAR	
$\overline{KO4}$	CD SYNCHRO	TAPE RETURN	PEAK MODE	METER RANGE	
$\overline{KO5}$	–	DISPLAY RETURN	COUNTR MODE	COUNTR RESET	
$\overline{KO6}$	–	REMAIN Ver.	Ver. bit1	Ver. bit0	→Refer to KEY and LED arrangement for each version.

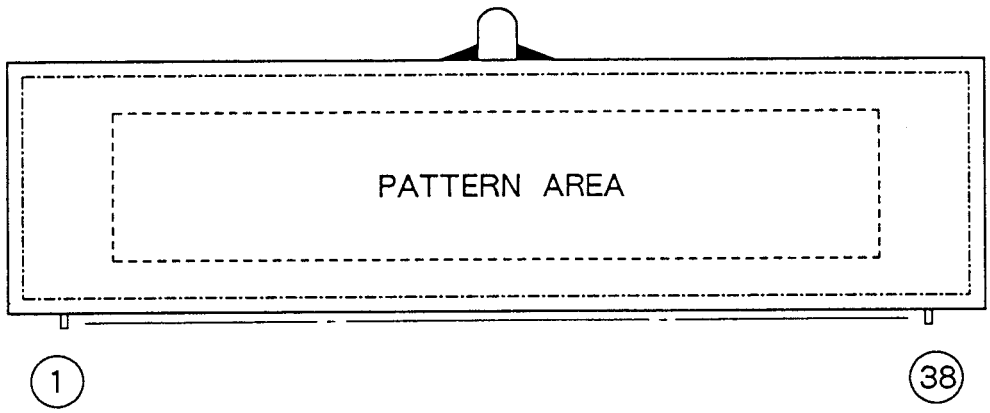
- To detect the on/off of KEY and Ver., set $\overline{KO}$ pin to "L". It is on when $\overline{KI}$ is "L" and off when "H".
- Detections of the on/off of Ver. REMAIN, Ver. bit1, Ver. bit0 are performed only once during the initialization of power on.
- Normally sets $\overline{K0}$ to $\overline{K6}$ to "L", and performs scanning only when one of $\overline{KI0}$ to $\overline{KI3}$ becomes "L".

PIN DESCRIPTION

Pin No.	Name	Function
1	S16	FL segment data output pins.
2	S15	
3	S14	
4	S13	
5	S12	
6	S11	
7	S10	
8	S09	
9	S08	
10	S07	
11	S06	
12	S05	
13	S04	
14	S03	
15	S02	
16	S01	
17	S00	
18	CrO2	Input pins of the tape position detection switch of the mechanism.
19	NORMAL	
20	$\overline{\text{REC INH}}$	Input pin of the REC INH switch of the mechanism. Recording prohibited at level "L".
21	–	–
22	$\overline{\text{REMOTE}}$	Interrupting pin which detects the remote control unit signal input at level "L".
23	$\overline{\text{SIO REQ}}$	Input pin of the communication request from the main CPU. Set at level "L" during communication.
24	FROM CD	CD synchronization data input pin.
25	SYNC INH	When a cable is connected to the CD SYNCHRO jack of rear panel, it becomes level "L" and CD synchronization operation permission condition is set.
26	$\overline{\text{TIMER PLAY}}$	TIMER PLAY switch input pin of the front panel. Timer PLAY operates at level "L".
27	$\overline{\text{TIMER REC}}$	TIMER REC switch input pin of the front panel. Timer REC operates at level "L".
28	SCK	Output pin of the communication timing signal (CLOCK) with the expansion output IC (IC781).
29	DATA	Output pin of the data to the expansion output IC (IC781).
30	$\overline{\text{BLE MODE}}$	Outputs level "L" during the operation of the FLAT function, and switches each circuit of the amplifier system.

Pin No.	Name	Function
31	PB MUT	Not connected.
32	Vcc	Connected to +5V.
33	$\overline{\text{SCI in}}$	Input pin of the communication timing (CLOCK) from the main CPU.
34	SI	Input pin of the communication data from the main CPU.
35	SO	Output pin of the communication data to the main CPU.
36	SIO ENABLE	Output pin of the communication permission signal to the main CPU. When the SIO REQ pin (Pin 23) becomes level "L", it outputs level "H" to this pin, and communication begins.
37	$\overline{\text{BLE CrO2}}$	Outputs level "L" when operating the FLAT function with a TYPE II (Cr02) tape, and switches the recording equalizer.
38	$\overline{\text{KEY OUT 0}}$	KEY SCAN data output pins.
39	$\overline{\text{KEY OUT 1}}$	
40	$\overline{\text{KEY OUT 2}}$	
41	$\overline{\text{KEY OUT 3}}$	
42	$\overline{\text{KEY OUT 4}}$	
43	$\overline{\text{KEY OUT 5}}$	
44	$\overline{\text{KEY OUT 6}}$	
45	$\overline{\text{KEY IN 0}}$	KEY SCAN data input pins.
46	$\overline{\text{KEY IN 1}}$	
47	$\overline{\text{KEY IN 2}}$	
48	$\overline{\text{KEY IN 3}}$	
49	RESET	Microprocessor is reset with the input of the level "H" pulse wave.
50	+5V	Connected to +5V.
51	OSC1	Connects the 4.19 MHz ceramics filter oscillator with the clock input pin.
52	OSC2	
53	GND	Connected to GND.
54	–	–
55	$\overline{\text{HX – PRO}}$	Outputs level "L" and turns HX – PRO on.
56	$\overline{\text{DOLBY – S}}$	Outputs level "L" and turns DOLBY – S on.
57	DOLBY – SELO	Switches DOLBY OFF/B/C with the 2 bits of pins 57 and 58.
58	DOLBY – SEL1	
59	G5	FL segment data output pins.
60	G4	
61	G3	
62	G2	
63	G1	
64	S17	

• FL INFORMATION



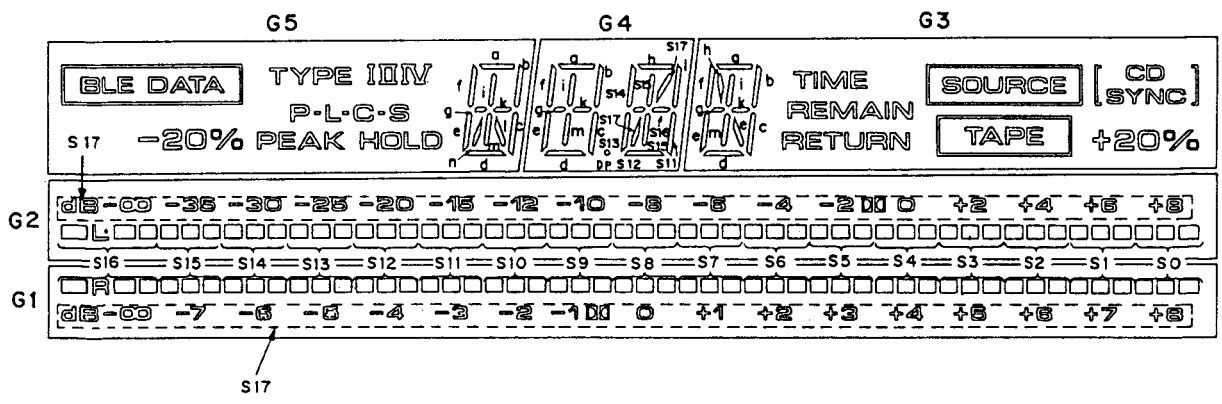
Pin Connection

TERMINAL NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
ELECTRODE	F1	F1	NP	NP	5G	4G	3G	2G	1G	P 18	P 17	P 16	P 15	P 14	P 13	P 12	P 11	P 10	P 9

TERMINAL NO.	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
ELECTRODE	P 8	P 7	P 6	P 5	P 4	P 3	P 2	P 1	P 0	NP	NP	NP	NP	NP	NP	NP	NP	F2	F2

Notes : F : Filament
G : Grid
P : Anode
NP : No Pin

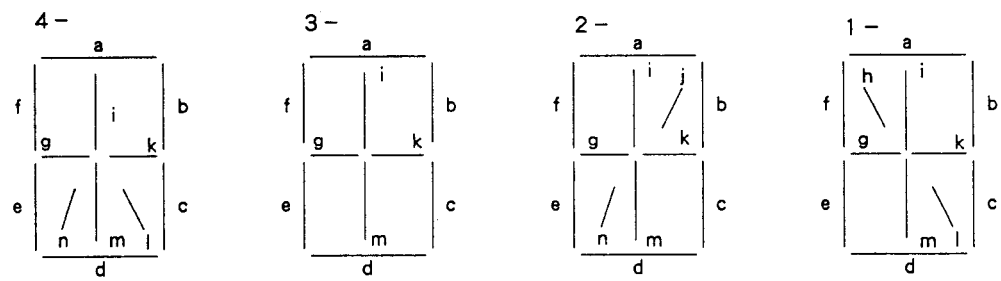
FL Segment/Grid Pattern



FL MATRIX TABLE

	G5	G4	G3	G2	G1
S 00	4th digit a	3rd digit a	2nd digit a	Lch + 8gB	Rch + 8gB
S 01	b	b	b	+ 6gB	+ 6gB
S 02	c	c	x	+ 4gB	+ 4gB
S 03	d	d	d	+ 2gB	+ 2gB
S 04	e	e	e	0gB	0gB
S 05	f	f	f	− 2gB	− 2gB
S 06	i + m	i + m	i + m	− 4gB	− 4gB
S 07	g	g + k	g	− 6gB	− 6gB
S 08	k		k	− 8gB	− 8gB
S 09	l + n	2nd digit a	h	− 10gB	− 10gB
S 10	IV	b	l	− 12gB	− 12gB
S 11	II	c	TIME	− 15gB	− 15gB
S 12	I	d	REMAIN	− 20gB	− 20gB
S 13	TYPE	e	RETURN	− 25gB	− 25gB
S 14	BLE DATA	f	TAPE	− 30gB	− 30gB
S 15	− 20 %	i + m	SOURCE	− 35gB	− 35gB
S 16	PEAK	g + k	[CD SYNC]	Lch − ∞ POINT	Rch − ∞ POINT
S 17	HOLD	j + n	+ 20 %	WIDE RANGE SCALE	EXAND RANGE SCALE
S 18	P.L.C.S	−	−	−	−

• The left digit of the 4 digits of the 7 segment display is 4 − , and the right is 1 − .



• 7 segment displays other than numbers are as shown in the following table.

CHARACTER DISPLAY

Display	Display Condition
WAIT	During power on, lights up for 4 seconds.
OPEN	When mechanism is ejected, lights up for 4 seconds.
BIAS	Lights up during BLE tuning operation.
LEVL	Lights up during BLE tuning operation.
EQ	Lights up during BLE tuning operation.
Err	Blinks if BLE tuning is not completed.
PLCS	Lights up for 2 seconds when PLCS mode has been set.
P −__	Data "00" to "15" light up during skipping song selection.
P +__	
C60	If the tape length is selected when counter is in remain mode, lights up or blinks until calculation results are output.
C46L	
C90	
C80L	

9. CIRCUIT DESCRIPTIONS

9.1 OPERATING PRINCIPLE OF DOLBY S TYPE RECORDING SYSTEM

9.1.1 Minimum Processing

The complementary type noise reduction system functions by boosting the low level signal during recording, and lowering it and the noise added during playback. The high level signal is not boosted so as to prevent tape saturation. Moreover to prevent derivative effects such as noise modulation, in cases where the high level signal is absent, ideal noise reduction systems will perform a operation which will become a fixed gain even if the high level signal is outside the spectrum. This is called "Minimum Processing" principle. This principle is more widely adopted in dolby S type systems rather than those used by the general public. As a result, there are almost no cases where the high level signal disadvantageously affects the low level signal, and no possibilities of this as well. This system also serves to ease secondary audio effects.
In addition, it can also hold down effects of decoding errors produced when tapes which have not been adjusted properly according to the specifications of the cassette recorder are used. Moreover, when the S type recording is decoded by the dolby B type or played back and heard without decoding, dynamic defects which will hurt your ears such as "Pumping" will not be produced.

9.1.2 Action Substitution

In high bands where cassette noises increase, the dolby S type system is equipped with a fixed band processing circuit and sliding band processing circuit. (In low bands where noises have the tendency to decrease considerably, only the fixed band is used.)
Using this combination, action substitution which maximizes the advantages of the operations of each circuit and minimizes defects can actually be performed.
Action substitution includes in its operations the "Minimum processing" principle of the noise reduction band.
This minimizes the dropping of the recording compression using higher frequency bands than the high level signals produced when only the fixed band circuit is used, and using lower frequency bands than the high level signals produced when only the sliding band is used. As a result, the effects of the high level signal on the low level signal in the noise reduction band can be reduced to minimum.

9.1.3. Modulation Control

In contrast to the reduction of the effects of the medium high level signal by action substitution inside the noise reduction band, modulation control minimizes the effects of extremely large high level signals outside the noise reduction band.
For example, if modulation control is not present, the high band sliding band will try to move away from the signal to the high band as the level of the medium band signal increases. This decreases the effectiveness of the audible noise reduction.
With modulation control, the sliding band is prevented from sliding more than the required amount using a high level signal surpassing a fixed threshold value. Modulation control enables the low level signal to be compressed more steadily than ever before by following the "Minimum Processing" principle.

9.1.4 Gradation Processing Compression Operation

Noise reduction of more than 20 dB is obtained in the high band with the dolby S type system. If NR levels as high as this were to be obtained using conventional methods, this would mean subjecting the low level signal to excessively high compression rates. The dolby S type system compresses with two different gradation processing stages of the signal levels used. Compression rates are also kept comparatively low. This technology was developed with the dolby C type system and was improved to a great extent with the dolby SR.

9.1.5 Spectral Skewing and Anti-Saturation

This technology was also developed with the dolby C type system and improved with the dolby SR type system. Both are frequency shaping networks. Spectral skewing increases the resistance of the system against frequency characteristic errors, while anti – saturation effectively decreases the burden on tapes. Moreover, anti – saturation also increases the head – room and consequently reduces distortion. The dolby S type system is different from the dolby C type. Anti – saturation is used not only for the high band but for the low band as well. This is efficient for reducing low band distortions caused by the excessive boosting of a cassette's low band compensation during recording.

[Differences between Dolby S Type and Dolby SR Type Systems]

For the dolby S type system, the cassette media is very different to the 15/30 inch open – reel tape recorder used during operations. Noise spectrum components are also different, and transcriptions by low speed cassettes are also extremely small. Listening levels in general households are relatively lower than the monitor levels heard in studios. By conforming the dolby S type system to these conditions, it has become, compared to the dolby SR system, more compact and low – costing.

As the noises of the cassette tape gather in the high band, and transcription is comparatively smaller, the low band of the dolby S type system only requires one stage of the fixed band processing circuit.

On the other hand, for the dolby SR type system, the fixed and sliding bands both form the two stage low band processing circuit.

In regard to the high band, both the fixed and sliding bands are based on a two stage noise reduction circuit design for the dolby S type circuit, and both are based on a three stage noise reduction circuit design for the dolby SR type circuit.

This has completely erased the possibility of audible noise modulation in extremely loud listening levels during operations.

The greatest difference between these two systems is that for the dolby SR type, the noise reduction processing element is made up of 10 circuits whilst that for the dolby S type is made up of only 5.

9.2 DESCRIPTION OF DOLBY S TYPE NOISE REDUCTION TECHNOLOGY

9.2.1 S Type Circuit Operation

Like all other dolby noise reduction systems, the complementary system is also adopted for the S type. This system performs encoding during recording and complementary decoding during playback. The decoding operation is described in the following. The encoder can also select the decoding mode. This function is also applicable to types A, B, and SR as well.

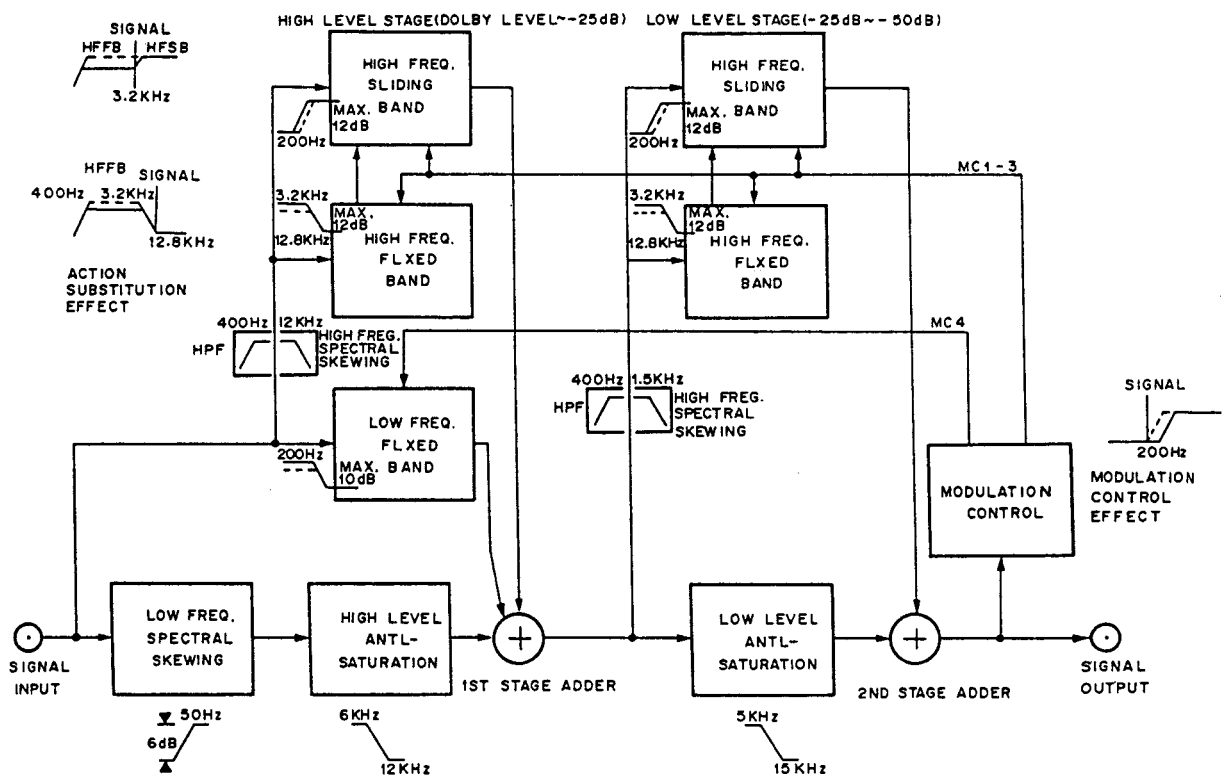


Fig. 1 S Type Encoder Structure Diagram

The encoder for the S type system, like that for the C type system, has two gradation compression circuit stages operating for different signal level areas. Both stages are made up of a main pass (main circuit) and a side chain (sub circuit) which produces the dynamic component and adds this to the main pass. There are three compression circuits in the high level stage of the side chain. These circuits are called high band fixed band (HF/FB), high band sliding band (HS/SB) and low band fixed band (LF/FB). The low level stage has a high band fixed band and a high band sliding band. The fixed band is limited to maintain the compression levels of frequencies lower than main signals above 6 kHz. This enables effective signal modulation by the encoder and general noise modulations to be reduced.
The fixed band and sliding band are used together with the "Action Substitution" technique.

The encoder output is fed back to the control system of each compression circuits via the filter, and is used to control compression operation according to the "Modulation Control" technique.

The spectral skewing circuit serves to decrease the sensitivity of the circuits for the spectral skewing ultra – low band and ultra – high band signals. This circuit is located at the input block of the encoder. Divided into the respective high band spectral skewing circuits in the high level and low level stages, the high band attenuator suppresses the increase in the compression rate in the high band. The two stage anti – saturation circuit has been designed to hold down the high band to prevent the saturation of the tape.

The encoder for the S type system optimizes the characteristics of the input signal so that the maximum amount of boosting can always be obtained in the low band and high band outside the main signal bands. The over – shoot suppressing circuit (O/S) has also been designed to obtain the maximum boost amount.

"Minimum Processing" is maintained constantly in this way for signals and output is stabilized so that fluctuations of the level is almost or completely absent. When a signal is decoded, maximum noise reduction effectiveness is obtained during frequencies below this signal, and the resistance power supply for characteristic errors in the transmission system will be maintained at level H. The maximum noise reduction level is 24 dB at high frequencies and 10 dB at low frequencies.

9.2.2 High Level Stage

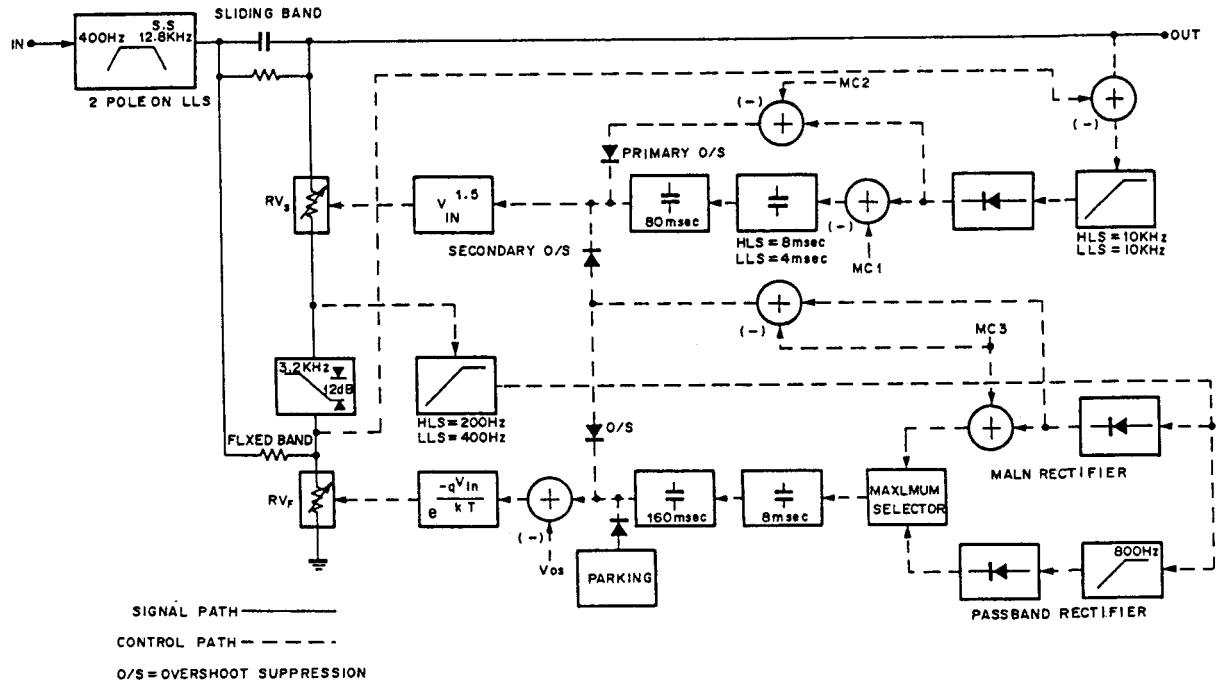


Fig. 2 S Type HF Stage Structure Diagram

The high level stage operates at signal levels above − 25 dB. It will boost signals to a maximum of 20 dB at frequencies above 400 Hz and boost signals to a maximum of 10 dB at frequencies below 200 Hz.

The low band fixed band is basically a passive low pass filter equipped with a variable attenuator at the last stage. The attenuation level increases as the signal level increases. The high band fixed band is the same as the low band fixed band above. It is made up of the high pass filter and variable attenuator circuit. As the cut − off frequency rises with the increase in signal levels and frequencies, the high band sliding band is a variable frequency high pass filter. (Same as NR processor for B and C types). The difference between the fixed high frequency and the input signal added with the fixed band output (replaced operation) is output for the input to the sliding band.

The control signal is created in the compression circuit. To obtain signals with stabilized and equal levels, it is first detected, and then rectified and smoothed. In addition to this processing, there is another separate route. For this route to suppress the over shoot in transient high level conditions, a voltage is quickly applied to the control system. The modulation control signal controls the attenuation level under the condition that the attenuation does not exceed the required amount when the control signal from the control system is attenuated. By supplying this final signal to the non − linear control low stage, the required attenuation level control voltage characteristic can be obtained.

9.2.3 Low Level Stage

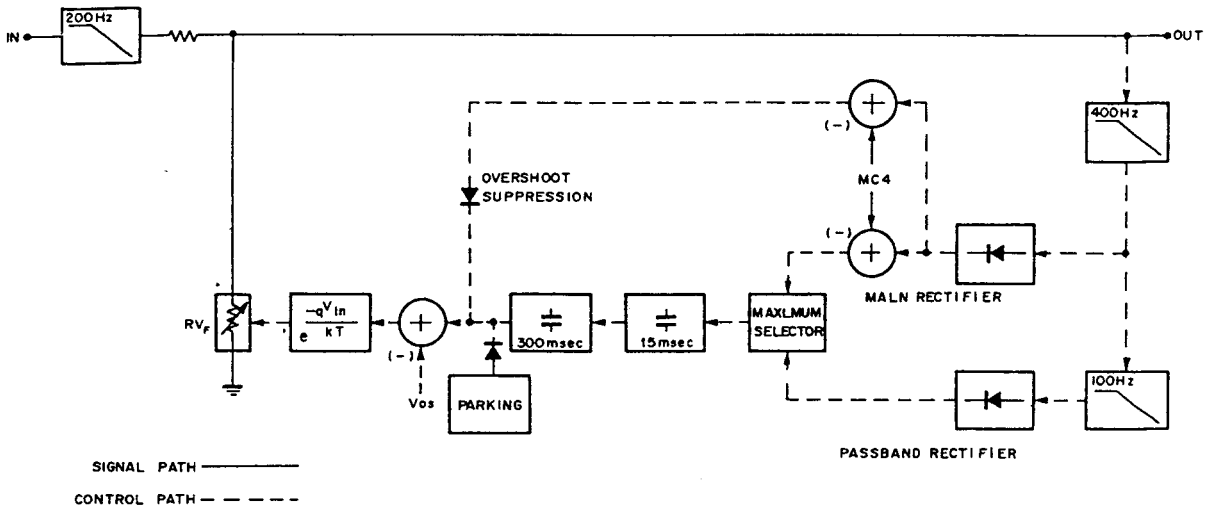


Fig. 3 S Type LF Stage Structure Diagram

The low level stage operates at signal levels in the range from − 50 dB to − 25 dB. Although this stage does not process low frequency signals, it operates like the high level stage in other aspects.

9.2.4 Modulation Control

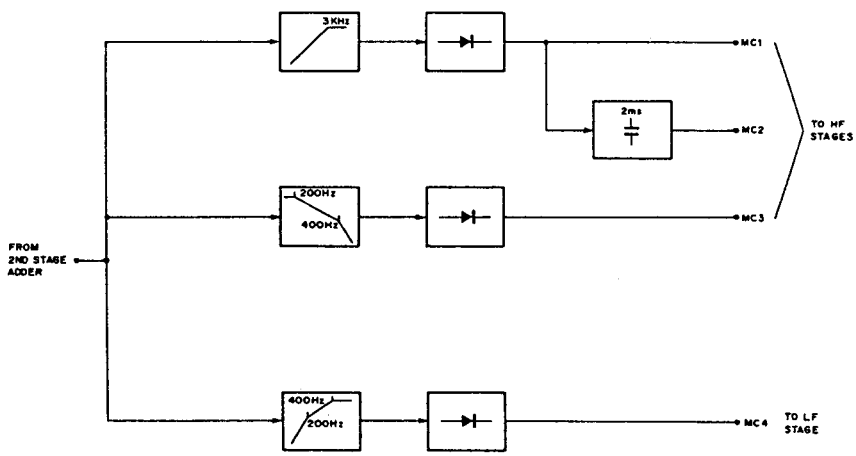
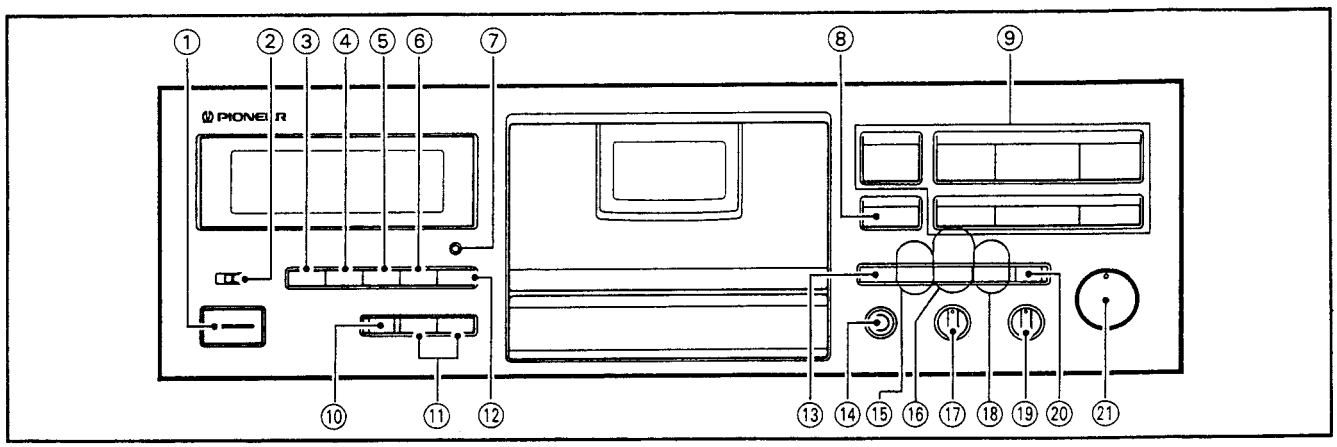


Fig. 4 S Type Modulation Control Circuit Structure Diagram

The modulation control circuit has been installed as an auxiliary to prevent the compression circuit from performing unnecessary modulations for high level signal inputs. The encoder output is transmitted to the input terminal of the modulation control circuit and divided into three frequency bands. The MC1 signal is subjected to all wave rectification after passing through the 3 kHz high pass filter. Next, it is supplied despite it being a high band sliding band. The MC2 signal is obtained by smoothing the MC1 signal using the 2 seconds time constant. Following it is supplied despite the fact that a high band sliding over − shoot suppression circuit exists.

MC3 passes through the 200 Hz and 400 Hz low pass filters like corner frequencies and is supplied despite the fact that a high band fixed band exists, after being subjected to all wave rectification. The low band fixed band is designed so that it is controlled by MC4. MC4 is subjected the all wave rectification after passing through the 200 Hz and 400 Hz high pass filters.

10. PANEL FACILITIES



① Power switch (POWER)

After pressing the switch, the WAIT mesage will appear in the counter display and the level meter scale will flash for about four seconds (the time necessary for circuitry to stabilize). During the time the display is flashing, no operating buttons will respond, with the exception of the cassette door open/close button (⏏). When closing the cassette door, do so while the power is turned on.

② Timer mode/repeat play switch (TIMER)

REC: Set to this position to perform timer recording.

OFF: Set to this position under ordinary conditions, (when not using the timer or repeat functions).

PLAY/REPEAT:

Set to this position to perform timer playback. When the switch is set to this position during normal playback, repeat playback of a single tape can be performed.

③ Counter mode button (COUNTER MODE)

Each time this button is pressed, one of the three mode (Normal tape counter/Time counter/Remaining time counter) is set in sequence.

④ Counter reset/Tape capacity selector button (COUNTER RESET/TAPE CAPA)

Reset the counter indication to "0000" in the normal tape counter or the time counter mode.

To indicate the correct time value in the remaining time counter mode, this button must be set in accordance with the tape used.

⑤ Level meter range selector button (METER RANGE)

Switches between wide range, expanded range, and bias display.

⑥ Level meter hold mode button (METER HOLD)

Selects the display mode of the peak level.

When press this button so that the PEAK HOLD indicator lights up, the level meter holds the maximum level indications of the signal. To erase the maximum level indications, press this button again. When the PEAK HOLD indicator goes off, the level meter holds peak indications for about 1.2 second.

⑦ Display off button (DISPLAY OFF)

Press this button to turn off the function display.

⑧ Open/close button (⏏)

Press this button to open or close the cassette door. Whenever inserting or removing a cassette tape, be sure that the power is turned on.

NOTE:

If the cassette door is closed while the unit is turned off, and the power is then turned on, the cassette door may open and close after pressing one of the operation buttons. This occurs when the microprocessor resets the door mechanism to its initial state and does not indicate any malfunctioning of the unit.

⑨ Operation buttons

- ■ : Stop
- ◀◀/MS : Rewind/music search
- ▶ : Playback
- ▶▶/MS : Fast forward/music search
- ● : Recording
- ▮▮ : Pause
- O : Recording mute

⑩ SUPER AUTO BLE START/CLEAR button

⑪ Recording bias buttons (BIAS −/+)

When desired, these buttons can be used to manually adjust the recording bias after performing AUTO BLE tuning.

−: Changes tone by reducing recording bias

+: Changes tone by increasing recording bias

⑫ Tape return button (TAPE RETURN)

This button is used in the normal tape counter mode to fast forward or rewind the tape to a point near the counter reading "0000."

⑬ Monitor selector button (MONITOR [AUTO])

Used to monitor the source sound or just recorded sound during recording.

- When the unit is set to record or playback mode, the TAPE indicator light up and the monitor mode is automatically selected.

⑭ Headphones jack (PHONES)

⑮ DOLBY NR OFF button

Press to turn off the DOLBY NR (noise reduction) system.

⑯ DOLBY NR B/C select button/indicator

Use to switch between DOLBY B type NR and DOLBY C type NR.

┌B→C┐

⑰ Headphones level control (PHONES LEVEL)

⑱ DOLBY NR S button/indicator

Use to turn on the DOLBY S type NR (noise reduction).

⑲ Recording balance control (REC BALANCE)

⑳ CD•DECK SYNCHRO recording button (CD SYNC)

㉑ Recording level control (REC LEVEL)

11. SPECIFICATIONS

System ..... 4 track, 2-channel stereo
Heads
Recording and playback head:
Hard permalloy playback head and Hard permalloy recording head combination × 1
Erasing head: Ferrite head with sendust guard × 1
Motor ..... DC servo capstan motor × 1
DC reel motor × 1
DC auxiliary motor × 1
Wow and Flutter ..... No more than 0.023%(WRMS)
No more than ±0.056% (DIN)
Fast Winding Time ..... Approximately 75 seconds (C-60 tape)

Frequency Response
−20 dB recording:
TYPE IV (Metal) tape ..... 15 to 22,000 Hz ±6 dB
TYPE II (HIGH/CrO_2) tape ..... 15 to 21,000 Hz ±6 dB
TYPE I (Normal) tape ..... 15 to 21,000 Hz ±6 dB
Signal-to-Noise Ratio (Dolby NR off) ..... More than 60 dB
Noise Reduction Effect
Dolby B-type NR ON ..... More than 10 dB (at 5 kHz)
Dolby C-type NR ON ..... More than 19 dB (at 5 kHz)
Dolby S-type NR ON ..... More than 22 dB (at 5 kHz)
Harmonic Distortion ..... No more than 0.6% (−4 dB)
Input (Sensitivity)
LINE (INPUT) ..... 95 mV (Input impedance 47 kΩ)
Output (Reference level)
LINE (OUTPUT) ..... 0.5 V (Output impedance 1.8 kΩ)
Headphone ..... 5.5 mW
(Load impedance 8 Ω, PHONES LEVEL control max.)

Subfunctions

- Super AUTO BLE system
- Bias control
- Dolby HX Pro Headroom Extension system
- Dolby S-type noise reduction system
- Dolby B-type and C-type noise reduction systems
- MPX filter
- Level meter with 2 modes peak hold selection (16 + 1 segments)
- Level meter range selection (wide/expanded)
- 4-digit electronic tape counter with mode selection
- Auto monitor selection (Tape/Source)
- Display off
- Music search (over ±15 selections)
- Automatic Tape Loose Canceller (ATLC)
- Tape return/Return play
- Auto space recording mute
- Auto tape selector
- Playback/recording timer start function
- CD•DECK SYNCHRO recording
- Headphones jack with level control
- Power eject (Open/Close)
- Repeat playback
- System remote control available
- Last memory

Miscellaneous

Power Requirements ..... AC 120 V, 60 Hz
Power Consumption 25W
Dimensions ..... 440(W) × 146(H) × 375(D) mm
17-1/3(W) × 5-3/4(H) × 14-3/4(D) in.
Weight (without package) ..... 8.3 (18 lb 5 oz.)

Accessories

Operating instructions 1
Connection cord with pin plugs 2
CD•DECK SYNCHRO control cord 1
Remote control cord 1

NOTE:
Specifications and design subject to possible modifications without notice, due to improvements.